

**This Page Is Inserted by IFW Operations
and is not a part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- **BLACK BORDERS**
- **TEXT CUT OFF AT TOP, BOTTOM OR SIDES**
- **FADED TEXT**
- **ILLEGIBLE TEXT**
- **SKEWED/SLANTED IMAGES**
- **COLORED PHOTOS**
- **BLACK OR VERY BLACK AND WHITE DARK PHOTOS**
- **GRAY SCALE DOCUMENTS**

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
18 January 2001 (18.01.2001)

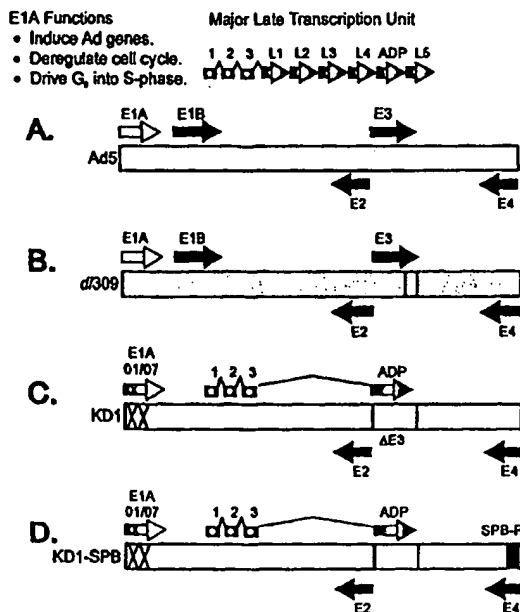
PCT

(10) International Publication Number
WO 01/04282 A2

- (51) International Patent Classification⁷: C12N 15/00 (72) Inventors; and
(75) Inventors/Applicants (for US only): WOLD, William S., M. [CA/US]; 1609 Adgers Wharf Boulevard, Chesterfield, MO 63017 (US). TOTH, Karoly [HU/US]; 7345 Fernbrook, Apt. 202, St. Louis, MO 63123 (US). DORONIN, Konstantin [RU/US]; 8133 Briarhaven Trail, Apt. 304, St. Louis, MO 63123 (US). TOLLEFSON, Ann, E. [US/US]; 9026 Philo Avenue, St. Louis, MO 63123 (US).
- (21) International Application Number: PCT/US00/18971
- (22) International Filing Date: 12 July 2000 (12.07.2000)
- (25) Filing Language: English
- (26) Publication Language: English (74) Agents: GENDLOFF, Elie, H. et al.; Suite 1400, 7733 Forsyth Blvd., St. Louis, MO 63105-1817 (US).
- (30) Priority Data:
09/351,778 12 July 1999 (12.07.1999) US (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:
US 09/351,778 (CIP)
Filed on 12 July 1999 (12.07.1999)
- (71) Applicant (for all designated States except US): SAINT LOUIS UNIVERSITY [US/US]; 221 N. Grand, St. Louis, MO 63103 (US).
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European

[Continued on next page]

(54) Title: REPLICATION-COMPETENT ANTI-CANCER VECTORS



(57) Abstract: Novel vectors which are replication-competent in neoplastic cells and which overexpress an adenovirus death protein are disclosed. Some of the disclosed vectors are replication-restricted to neoplastic cells or to neoplastic alveolar type II cells. Compositions and methods for promoting the death of neoplastic cells using these replication-competent vectors are also disclosed.



patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *Without international search report and to be republished upon receipt of that report.*

Replication-Competent Anti-Cancer Vectors

Reference to Government Grant

This invention was made with government support under a grant from the National Institutes of Health, Grant Number RO1 CA71704 and CA81829. The United States Government has certain rights in this invention.

5 Background of the Invention

(1) Field of the Invention

This invention relates generally to the treatment of cancer and more particularly to vectors which replicate in neoplastic cells and which overexpress an adenovirus death protein (ADP) and to the use of these vectors in treating human cancer.

10 (2) Description of the Related Art

Cancer is a leading cause of death in the United States and elsewhere. Depending on the type of cancer, it is typically treated with surgery, chemotherapy, and/or radiation. These treatments often fail: surgery may not remove all the cancer; some cancers are resistant to chemotherapy and radiation therapy; and chemotherapy-resistant tumors frequently develop.

15 New therapies are necessary, to be used alone or in combination with classical techniques.

One potential therapy under active investigation is treating tumors with recombinant viral vectors expressing anti-cancer therapeutic proteins. Adenovirus-based vectors contain several characteristics that make them conceptually appealing for use in treating cancer, as well as for therapy of genetic disorders. Adenoviruses (hereinafter used interchangeably with

"Ads") can easily be grown in culture to high titer stocks that are stable. They have a broad host range, replicating in most human cancer cell types. Their genome can be manipulated by site-directed mutation and insertion of foreign genes expressed from foreign promoters.

The adenovirion consists of a DNA-protein core within a protein capsid (reviewed by Stewart et al., "Adenovirus structure by x-ray crystallography and electron microscopy." in: *The Molecular Repertoire of Adenoviruses*, Doerfler, W. et al., (ed.), Springer-Verlag, Heidelberg, Germany, p. 25-38). Virions bind to a specific cellular receptor, are endocytosed, and the genome is extruded from endosomes and transported to the nucleus. The genome is a linear duplex DNA of about 36 kbp, encoding about 36 genes (Fig. 1A). In the nucleus, the "immediate early" E1A proteins are expressed initially, and these proteins induce expression of the "delayed early" proteins encoded by the E1B, E2, E3, and E4 transcription units (reviewed by Shenk, T. "Adenoviridae: the viruses and their replication" in: *Fields Virology*, Field, B.N. et al., Lippencott-Raven, Philadelphia, p. 2111-2148). E1A proteins also induce or repress cellular genes, resulting in stimulation of the cell cycle. About 23 early proteins function to usurp the cell and initiate viral DNA replication. Viral DNA replicates at about 7 h post-infection (p.i.), then late genes are expressed from the "major late" transcription unit. Major late mRNAs are synthesized from the common "major late promoter" by alternative pre-mRNA processing. Each late mRNA contains a common "tripartite leader" at its 5'-terminus (exons 1, 2, and 3 in Fig. 1), which allows for efficient translation of Ad late mRNAs. Cellular protein synthesis is shut off, and the cell becomes a factory for making viral proteins. Virions assemble in the nucleus at about 1 day p.i., and after 2-3 days the cell lyses and releases progeny virus. Cell lysis is mediated by the E3 11.6K protein, which has been renamed "adenovirus death protein" (ADP) (Tollefson et al., *J. Virol.* 70:2296-2306, 1996; Tollefson et al., *Virol.* 220:152-162, 1996). The term ADP as used herein in a generic sense refers collectively to ADP's from adenoviruses such as, e.g. Ad type 1 (Ad1), Ad type 2 (Ad2), Ad type 5 (Ad5) or Ad type 6 (Ad6) all of which express homologous ADP's with a high degree of sequence similarity.

Human adenovirus type 5 (Ad5) is particularly useful for cancer gene therapy. It primarily causes asymptomatic or mild respiratory infections in young children, followed by long term effective immunity. Fatalities are extremely rare except when the patient is immunocompromised (Horwitz, M. S., *Adenoviruses*, p. 2149-2171 In B. N. Fields, D. M. Knipe, and P. M. Howley (eds.), *Fields Virology*, Lippincott-Raven Publishers, Philadelphia, PA, 1996). Ad5 is very well understood, can be grown in culture to high titer stocks that are stable, and can replicate in most human cancer cell types (Shenk, T., *Adenoviridae: the viruses and their replication*, p. 2111-2148. In B. N. Fields, D. M. Knipe, and P. M. Howley

(eds.), Fields Virology, Lippincott-Raven, Philadelphia, 1996). Its genome can be manipulated by site-directed mutagenesis and insertion of foreign sequences.

The Ad vectors being investigated for use in anti-cancer and gene therapy are based on recombinant Ad's that are either replication-defective or replication-competent. Typical
5 replication-defective Ad vectors lack the E1A and E1B genes (collectively known as E1) and contain in their place an expression cassette consisting of a promoter and pre-mRNA processing signals which drive expression of a foreign gene. The E1A proteins induce transcription of other Ad genes, and in nontransformed cells they deregulate the cell cycle, induce or repress a variety of cellular genes, and force cells from G₀ into S-phase 48 (White,
10 E., *Semin. Virol.* 8:505-513, 1998; Wold et al., pp. 200-232 *In* A.J. Cann (ed.), DNA Virus Replication: Frontiers in Molecular Biology, Oxford University Press, Oxford). The E1B proteins inhibit cellular apoptosis. *Id.* These vectors are unable to replicate because they lack the E1A genes required to induce Ad gene expression and DNA replication. In addition, the E3 genes are usually deleted because they are not essential for virus replication in cultured
15 cells.

A number of investigators have constructed replication-defective Ad vectors expressing anti-cancer therapeutic proteins. Usually, these vectors have been tested by direct injection of human tumors growing in mouse models. Most commonly, these vectors express the thymidine kinase gene from herpes simplex virus, and the mice are treated with
20 gancyclovir to kill cells transduced by the vector (see e.g., Felzmann et al., *Gene Ther.* 4:1322-1329, 1997). Another suicide gene therapy approach involves injecting tumors with a replication defective Ad vector expressing cytosine deaminase, followed by administration of 5-fluorocytosine (Topf et al., *Gene Ther.* 5:507-513, 1998). Investigators have also prepared and tested replication-defective Ad vectors expressing a cytokine-such as IL-2, IL-12, IL-6,
25 tumor necrosis factor (TNF), type I interferons, or the co-stimulatory molecule B7-1 in the anticipation that the Ad-expressed cytokine will stimulate an immune response, including cytotoxic T-lymphocytes (CTL), against the tumor (Felzmann et al., *supra*; Putzer et al., *Proc. Natl. Acad. Sci. USA* 94:10889-10894, 1997). Other vectors express tumor antigens (e.g. melanoma MART1), proteins that de-regulate the cell cycle and induce apoptosis (p53, pRB, p21^{Kip1/WAF1}, p16^{CDKN2}, and even Ad E1A), and ribozymes. An Ad vector expressing FasL
30 induces apoptosis and tumor regression of a mouse tumor (Arai et al., *Proc. Natl. Acad. Sci. USA* 94:13862-13867, 1997).

Despite these generally positive reports, it is recognized in the art that replication-defective Ad vectors have several characteristics that make them suboptimal for
35 use in therapy. For example, production of replication-defective vectors requires that they be grown in a complementing cell line that provides the E1A proteins in trans. Such cell lines

are fastidious, and generation of virus stocks is time-consuming and expensive. In addition, although many foreign proteins have been expressed from such vectors, the level of expression is low compared to Ad late proteins.

To address these problems, several groups have proposed using replication-competent Ad vectors for therapeutic use. Replication-competent vectors retain Ad genes essential for replication and thus do not require complementing cell lines to replicate. Replication-competent Ad vectors lyse cells as a natural part of the life cycle of the vector. Another advantage of replication-competent Ad vectors occurs when the vector is engineered to encode and express a foreign protein. Such vectors would be expected to greatly amplify synthesis of the encoded protein *in vivo* as the vector replicates. However, in order to prevent RC vectors from damaging normal tissues and causing disseminated viremia, it is important that they have some feature that limits their replication to cancer cells.

Wyeth Laboratories developed replication-competent Ad vectors for vaccination purposes, using vaccine strains of Ad serotypes 4, 7, and 5 (Lubeck et al., *AIDS Res. Hum. Retroviruses* 10:1443-1449, 1994). Foreign genes were inserted into the E3 region (with the E3 genes deleted) or into a site at the right end of the genome. Two foreign genes used were hepatitis B surface antigen and the HIV envelope protein. They obtained good expression in culture, and were able to raise antisera in animal models. Phase I human trials were ambiguous, and the project was mostly abandoned.

Onyx Pharmaceuticals recently reported on adenovirus-based anti-cancer vectors which are replication deficient in non-neoplastic cells but which exhibit a replication phenotype in neoplastic cells lacking functional p53 and/or retinoblastoma (pRB) tumor suppressor proteins (U.S. Patent No. 5,677,178; Heise et al., *Nature Med.* 6:639-645, 1997; Bischoff et al., *Science* 274:373-376, 1996). This phenotype is reportedly accomplished by using recombinant adenoviruses containing a mutation in the E1B region that make the encoded E1B-55K protein incapable of binding to p53 and/or a mutation(s) in the E1A region which make the encoded E1A protein (p289R or p243R) incapable of binding to pRB and/or the cellular 300 kD polypeptide and/or the 107 kD polypeptide. E1B-55K has at least two independent functions: it binds and inactivates the tumor suppressor protein p53, and it is required for efficient transport of Ad mRNA from the nucleus. Because these E1B and E1A viral proteins are involved in forcing cells into S-phase, which is required for replication of adenovirus DNA, and because the p53 and pRB proteins block cell cycle progression, the recombinant adenovirus vectors described by Onyx should replicate in cells defective in p53 and/or pRB, which is the case for many cancer cells, but not in cells with wild-type p53 and/or pRB. Onyx has reported that replication of an adenovirus lacking E1B-55K, which is named ONYX-015, was restricted to p53-minus cancer cell lines (Bischoff et al., *supra*), and

that ONYX-015 slowed the growth or caused regression of a p53-minus human tumor growing in nude mice (Heise et al., *supra*). Others have challenged the Onyx report claiming that replication of ONYX-015 is independent of p53 genotype and occurs efficiently in some primary cultured human cells (Harada and Berk, *J. Virol* 73:5333-5344, 1999). It is now known that ONYX-015 can replicate in cells with wild-type p53 (Goodrum et al., *J. Virol.* 72:9479-9490, 1998; Harada et al., *J. Virol.* 73:5333-5344, 1999; Hay et al., *Hum. Gene Ther.* 10:579-590, 1999; Rothmann et al., *J. Virol.* 72:9470-9478, 1998; Turnell et al., *J. Virol.* 73:2074-2083, 1999). ONYX-015 does not replicate as well as wild-type adenovirus because E1B-55K is not available to facilitate viral mRNA transport from the nucleus. Also, ONYX-015 expresses less ADP than wild-type virus (see Example 1 below).

As an extension of the ONYX-015 concept, a replication-competent adenovirus vector was designed that has the gene for E1B-55K replaced with the herpes simplex virus thymidine kinase gene (Wilder et al., *Gene Therapy* 6:57-62, 1999). The group that constructed this vector reported that the combination of the vector plus gancyclovir showed a therapeutic effect on a human colon cancer in a nude mouse model (Wilder et al., *Cancer Res.* 59:410-413, 1999). However, this vector lacks the gene for ADP, and accordingly, the vector will lyse cells and spread from cell-to-cell less efficiently than an equivalent vector that expresses ADP. The gene for ADP is also lacking in another replication-competent adenovirus vector that has been described, in which a minimal enhancer/promoter of the human prostate specific antigen was inserted into the adenovirus E1A enhancer/promoter (Rodriguez et al., *Cancer Res.* 57:2559-2563, 1997).

Another strategy for replication-competent vector improvement is to place replication under the control of tissue-specific promoters. One group replaced the basal E1A promoter with a modified promoter for α -fetoprotein (AFP) (Hallenbeck et al., *Hum. Gene Ther.* 10:1721-1733, 1999). AFP is expressed in the liver during development, but it is not expressed in adults. However, it is expressed in 70-80% of patients with hepatocellular carcinoma. Growth of this vector was limited to AFP-expressing cells and the vector showed some suppression of xenotransplants. *Id.* A series of RC vectors has also been developed that have expression of the E1A and E1B genes dependent on the prostate tumor-specific prostate specific antigen (PSA) and kallikrein promoters/enhancers (Rodriguez et al., *Cancer Res.* 60:1196, 1997; Yu et al., *Cancer Res.* 59:4200-4203, 2000; Yu et al., *Cancer Res.* 59:1498-1504, 1999).

Thus, there is a continuing need for vectors that replicate and spread efficiently in tumors but that can be modified such that they replicate poorly or not at all in normal tissue.

Summary of the Invention

Briefly, therefore, the present invention is directed to novel vectors which are replication competent in neoplastic cells and which overexpress an adenovirus death protein (ADP). The work reported herein demonstrates the discovery that overexpression of ADP by a recombinant adenovirus allows the construction of a replication-competent adenovirus that kills neoplastic cells and spreads from cell-to-cell at a rate similar to or faster than that exhibited by adenoviruses expressing wild-type levels of ADP, even when the recombinant adenovirus contains a mutation that would otherwise reduce its replication rate in non-neoplastic cells. This discovery was unexpected because it could not have been predicted from what was known about adenovirus biology that Ad vectors overexpressing ADP remain viable and that the infected cells are not killed by the higher amounts of ADP before the Ad vector produces new virus particles that can spread to other tumor cells. Indeed, naturally-occurring adenoviruses express ADP in low amounts from the E3 promoter at early stages of infection, and begin to make ADP in large amounts only at 24-30 h p.i., once virions have been assembled in the cell nucleus. It is believed that other non-adenoviral vectors can be used to deliver ADP's cell-killing activity to neoplastic cells, including other viral vectors and plasmid expression vectors.

Thus, in one preferred embodiment, the ADP-expressing vector comprises a recombinant adenovirus lacking expression of at least one E3 protein selected from the group consisting of: gp19K; RID α (also known as 10.4K); RID β (also known as 14.5K) and 14.7K. Because these E3 proteins inhibit immune-mediated inflammation and/or apoptosis of Ad-infected cells, it is believed that a recombinant adenovirus lacking one or more of these E3 proteins will stimulate infiltration of inflammatory and immune cells into a tumor treated with the adenovirus and that this host immune response will aid in destruction of the tumor as well as tumors that have metastasized. The ADP expressed by preferred embodiments comprises a naturally-occurring amino acid sequence from a human adenovirus of subgroup C, namely Ad1, Ad2, Ad5 and Ad6.

In another embodiment, replication of the vector is restricted to neoplastic cells. Such replication-restricted vectors are useful in treating cancer patients in which it is desirable to eliminate or reduce damage to normal cells and tissues that might be caused by the vector, particularly viral vectors that kill the host cell as part of their life cycle. In preferred embodiments, a recombinant adenovirus has a replication-restricted phenotype because the recombinant adenovirus is incapable of expressing an E1A viral protein which binds the pRB and the p300/CBP proteins or because the E4 promoter has been substituted with a promoter that is activated only in neoplastic cells and/or cells of a specific tissue.

In yet another embodiment, the invention provides a vector which overexpresses ADP and whose replication is under the control of a tissue specific promoter, tumor specific

promoter or an inducible promoter. In preferred embodiments, the vector comprises a recombinant adenovirus in which the tissue specific promoter or inducible promoter is substituted for the E4 promoter. Such vectors are useful for restricting replication of the vector and its ADP-mediated cell killing to cells of a particular type or to cells exposed to an exogenous agent that activates the promoter. A preferred tissue-specific or inducible vector also expresses a phenotype that restricts its replication to neoplastic cells.

In yet another embodiment, the invention provides a vector which overexpresses ADP but which is not restricted to tumors by a specific genetic modification. Such a vector is more destructive to neoplastic cells than even the naturally occurring Ad's of subgroup C. In preferred embodiments, this vector could be used for patients with terminal cancer not treatable by another method, and who have pre-existing neutralizing antibodies to Ad or to which neutralizing antibodies can be administered.

In still another embodiment, the invention provides a composition comprising a first recombinant virus which is replication competent in a neoplastic cell and overexpresses the adenovirus death protein. In one embodiment, the recombinant virus is contained within a delivery vehicle comprising a targeting moiety that limits delivery of the virus to cells of a certain type. With this embodiment, the replication-competent vector can be of any ADP-overexpressing configuration described herein. In some embodiments, the composition also comprises a second recombinant virus which is replication-defective and which expresses an anti-cancer gene product. In some embodiments, the replication-defective vector may be engineered to overexpress ADP when replication of this vector is complemented by a replication-competent vector. The recombinant virus complements spread of the replication-defective virus, as well as its encoded anti-cancer product, throughout a tumor. In preferred embodiments, the first recombinant virus is a recombinant adenovirus whose replication is restricted to neoplastic cells and/or which lacks expression of one or more of the E3 gp19K; RID α ; RID β ; and 14.7K proteins.

In additional embodiments, the invention provides replication-competent vectors that overexpresses an ADP and also expresses an anti-cancer product. As with previous embodiments, the vector can be of any ADP-overexpressing configuration provided herein. Preferably, replication of the virus is engineered to (a) be restricted to neoplastic cells, e.g., by replacing the E4 promoter with a tissue specific or tumor specific promoter and/or (b) lack expression of one or more of the E3 gp19K; RID α ; RID β ; and 14.7K proteins. In some embodiments, the anti-cancer product is inserted into the E3 region.

The ADP-expressing vectors and compositions of the invention are useful in a method for promoting death of a neoplastic cell. The method comprises contacting the neoplastic cell with a vector which is replication-competent in the neoplastic cell and which

overexpresses ADP. Where the neoplastic cell comprises a tumor in a patient, the vector is administered directly to the tumor or, in other embodiments, the vector is administered to the patient systemically or in a delivery vehicle containing a targeting moiety that directs delivery of the vector to the tumor. In embodiments where the vector is a recombinant virus, the method can also comprise passively immunizing the patient against the virus.

In yet another embodiment of the invention, the vector may be used in combination with radiation therapy. The radiation therapy can be any form of radiation therapy used in the art such as for example, external beam radiation such as x-ray treatment, radiation delivered by insertion of radioactive materials within the body near or at the tumor site such as treatment with gamma ray emitting radionuclides, particle beam therapy which utilizes neutrons or charged particles and the like. In addition, this embodiment encompasses the use of more than one of the vectors of the present invention in a cocktail in combination with radiation therapy.

Another embodiment of the invention involves the use of the recombinant vector in combination with chemotherapy as has been disclosed for other adenovirus vectors (U.S. Patent No. 5,846,945). Chemotherapeutic agents are known in the art and include antimetabolites including pyrimidine-analogue and purine-analogue antimetabolites, plant alkaloids, antitumor antibiotics, alkylating agents and the like. The use of more than one of the vectors of the present invention with a chemotherapeutic agent or agents is also contemplated within this embodiment.

Among the several advantages found to be achieved by the present invention, therefore, may be noted the provision of replication-competent vectors, particularly viruses, which rapidly kill cancer cells and spread from cell-to-cell in a tumor; the provision of such vectors whose replication can be induced or which is restricted to tumors and/or to cells of a certain tissue type; and the provision of compositions and methods for anti-cancer therapy which cause little to no side effects in normal tissues.

Brief Description of the Drawings

Figure 1 is a schematic of gene expression in Ad5 (Fig. 1A) and KD3, a preferred embodiment of the invention (Fig. 1B), in which the respective genomes are represented by the stippled bars and transcription units represented by arrows above and below the bars, with the E3 proteins listed above the arrows for the E3 transcription unit, and the L1 to L5 families of late mRNA's indicated.

Figure 2 illustrates the overexpression of ADP by KD1, KD3, GZ1, and GZ3 showing an immunoblot of proteins isolated from human A549 cells infected with the indicated viruses and probed with an anti-ADP antibody, with ADP indicating differently glycosylated and proteolytically processed forms of ADP.

Figure 3 illustrates that the E1A *d1101/1107* mutation referred to in the figure and hereinafter as *d101/07*, retards expression of late proteins, showing an immunoblot of E1A proteins and late proteins in A549 cells infected with the indicated viruses in the absence (Figs. 3A and 3B) or presence (Figs. 3C and 3D) of *d1327*, which has a wild-type E1A region and has a deletion of all E3 genes but the gene encoding the 12.5K protein (Figs. 3C and 3D). An antiserum specific to the E1A proteins was used for Fig. 3A and 3C. An antiserum raised against Ad5 virions was used for Figs. 3B and 3D.

Figure 4 illustrates that KD1 and KD3 kill cells more efficiently than control viruses that express less or no ADP, showing a graph of the percent of A549 cells infected with the indicated viruses that were viable at the indicated days p.i. as determined by trypan blue exclusion.

Figure 5 is a cell spread assay illustrating that overexpression of ADP enhances spread of virus from cell to cell, showing monolayers infected with the indicated viruses at the indicated PFU/cell which were treated at 7 days p.i. with crystal violet, which stains live cells but not dead cells.

Figure 6 illustrates that KD1 and KD3 replicate well in growing cells but not in growth-arrested cells showing the virus titer extracted from growing or growth arrested HEL-229 cells at various times following infection with 100 PFU/ml of the following viruses: *d1309* (Fig. 6A), *d101/07* (fig. 6B), KD1 (Fig. 6C) and KD3 (Fig 6D).

Figure 7 illustrates that KD1 and KD3 are defective in killing primary human bronchial epithelial cells showing these cell monolayers infected at 30% confluency with 10 PFU/ml of the indicated viruses and stained at 5 days p.i. with neutral red.

Figure 8 illustrates that KD1 and KD3 reduce the growth rate of human A549 cell tumors growing in nude mice, showing in Fig. 8A a graph of average-fold increase in tumor size plotted against the number of weeks following infection of the tumor with buffer or with 5×10^7 PFU at weekly intervals of or the indicated viruses, and showing in Fig. 8B a similar graph of tumors injected once with 5×10^8 PFU of KD3 or GZ3.

Figure 9 illustrates that KD1 and KD3 reduce the growth rate of human Hep3B cell tumors growing in nude mice, showing a graph of average-fold increase in tumor size plotted against the number of weeks following injection of the tumor with buffer or with 5×10^7 PFU of *d1309*, KD1 or KD3 at twice weekly intervals of the indicated viruses.

Figure 10 illustrates that KD1 and KD3 complement the replication and spread of Ad- β -gal, a replication-defective vector that expresses β -galactosidase, using an infectious center assay showing in Fig. 10A a picture of A549 cell monolayers seeded with A549 cells infected with Ad- β -gal alone or with the indicated viruses, with Figs 10B and 10C showing close-up views of two of the monolayers of Fig. 10A.

Figure 11 is a bar graph illustrating that KD1 and KD3 increase the expression of luciferase in human Hep3B cell tumors growing in nude mice, using an assay in which tumors were injected with the indicated combinations of viruses, then were extracted 2 weeks p.i. and assayed for luciferase activity. The numbers in parentheses indicated the fold increase in luciferase activity compared to that of the Adluc vector plus buffer.

Figure 12 is a graph showing the results of a standard plaque development assay for KD1 and KD1-SPB on A549 cells engineered to express the TTF1 transcription factor (A549/TTF1) and the parental 549 cells, in which data are plotted as the number of plaques observed on a particular day in the assay divided by the final number of plaques observed for that virus multiplied by 100.

Figure 13 is a cell spread assay for KD1 and KD1-SPB on H441 cells and Hep3B cells, where cells were infected with the indicated amounts of KD1 or KD1-SPB and H441 cells and Hep3B cells were stained with crystal violet at 5 days p.i. and 8 days p.i., respectively.

Figure 14 is a graph showing the results of a standard plaque development assay for dI309 and two preferred embodiments of the invention, GZ1 and GZ3, in which data are plotted as the number of plaques observed on a particular day in the assay divided by the final number of plaques observed for that virus multiplied by 100.

Figure 15 is a cell spread assay illustrating that the combination of KD1, KD3, GZ1, or GZ3 with x-ray radiation is more effective in destroying A549 cell monolayers than is virus vector alone or radiation alone, wherein cells were infected with the indicated amounts of the indicated viruses, radiated with 600 centigreys (cGy) of x-radiation (bottom panel), or mock radiated (top panel), then stained with crystal violet at 6 days p.i.

Figure 16 is a graph of a cell spread assay illustrating that 10^{-3} PFU of KD1, KD3, GZ1, or GZ3 used in combination with 150, 300, or 600 centigreys of radiation is more effective in destroying A549 cell monolayers than virus vector alone or radiation alone. Cell viability is based on the amount of crystal violet extracted from the culture wells, using the mock-infected non-radiated well as 100% viability.

Figure 17 illustrates that the combination of KD3 or GZ3 plus x-ray radiation is more effective in reducing the growth of A549 cell tumors growing in nude mice than KD3 alone or GZ3 alone.

Figure 18 illustrates a structure-function analysis of ADP, showing in Fig. 18A the amino acid sequence of the adenovirus death protein encoded by Ad2, with the various putative domains and glycosylation sites labeled and showing in Fig. 18B a schematic of the ADP gene in *rec700* and in the indicated deletion mutants, with the right column

summarizing the death promoting phenotype of the various mutants as a percentage of the wild-type phenotype.

Figures 19A and 19B illustrate a cell viability assay of the indicated ADP mutants showing a graph of viability as determined by trypan blue exclusion plotted against hours (Fig. 19A) or days (Fig. 19B) postinfection.

Figure 20 depicts the amino acid sequence, shown in single letter code, for the ADP proteins of Ad1, Ad2, Ad5, and Ad6 (SEQ ID NOS:5-8), for the Ad2 ADP mutants *dl716*, *dl715*, *dl714*, and *dl737* (SEQ ID NOS:9-12), and for the putative luminal domain (SEQ ID NO:17), the transmembrane domain (SEQ ID NO:18), the cytosolic basic-proline domain (SEQ ID NO:19), and the remainder of the cytosolic domain (SEQ ID NO:20) of the ADP protein of Ad2.

Figure 21 presents the complete nucleotide sequence of the genome of Ad5.

Figure 22 presents the complete nucleotide sequence of the genome of KD1 (SEQ ID NO:1).

Figure 23 presents the complete nucleotide sequence of the genome of KD3 (SEQ ID NO:2).

Figure 24 is a schematic of the following vectors: A. Ad5. The stippled bar indicates the DNA genome of 36 kbp. The open arrow indicates the immediate early E1A transcription unit, and the black arrows are the delayed early E1B, E2, E3, and E4 transcription units. The hatched arrows indicate the five families of major late mRNAs, and also the ADP mRNA, which is synthesized as part of the major late transcription unit. Each major late mRNA has a tripartite leader (leaders 1, 2, and 3) spliced to its 5' terminus. B. dl309. dl309 is identical to Ad5 except it has the E3-RID and E3-14.7K genes deleted. dl309 expresses ADP at levels similar to Ad5. C. KD1. KD1 has two small deletions (indicated by "X" marks) in the E1A gene that abolish binding of the E1A proteins to pRB or p300/CBP. It lacks all E3 genes except adp. ADP is expressed earlier in infection and in greater abundance than is ADP from Ad5 or dl309 Doronin et al., *J. Virol.* 74:6147-6155. D. KD1-SPB. KD1-SPB is identical to KD1, except it has the E4 promoter replaced by the promoter for Surfactant Protein B (SPB-P).

Figure 25 presents graphs illustrating that KD1-SPB grows as well as KD1 in H441 lung carcinoma cells but much more poorly than KD1 in Hep 3B hepatoma cells. CsCl-banded stocks of KD1-SPB and KD1 were titrated using standard methods (Tollefson et al., p. 1-9 *In* W.S.M. Wold (ed.), *Adenovirus Methods and Protocols*. Humana Press, Inc., Totowa, NJ, 1998) on 293-E4 or 293 cells (A), or on A549 cells (B). The data are plotted as the number of plaques seen on any day of the plaque assay as a percentage of the number of plaques seen on the final day of the assay (Tollefson et al., *Virology* 220:152-162, 1996).

Figure 26 presents micrographs illustrating that KD1-SPB induces CPE in H441 cells but not Hep 3B cells. H441 and Hep 3B monolayers were mock-infected or infected with 10 PFU/cell of KD1 or KD1-SPB, then photographed under phase contrast at 4 or 7 days p.i.

Figure 27 depicts Southern hybridizations and a graph illustrating that KD1-SPB DNA is synthesized efficiently in H441 but not Hep 3B cells. H441 or Hep 3B cells were infected with 10 PFU/cell of KD1 or KD1-SPB. Total genomic DNA was isolated at 0, 5, 24, 48, 72, and 96 h p.i., digested with HindIII, resolved by agarose gel electrophoresis, blotted, and hybridized with ³²P-labeled Ad DNA. A. Autoradiogram. B. PhosphorImager quantitation of the DNA bands in Panel A.

Figure 28 presents graphs depicting single step growth curves showing that KD1-SPB grows well in H441 but not Hep 3B cells. Cells were infected with 10 PFU/cell of KD1 or KD1-SPB. Vectors were extracted at the indicated days p.i. and titers determined by plaque assay.

Figure 29 depicts immunoblots showing that KD1-SPB expresses E4ORF3 and ADP in H441 but not Hep 3B cells. Cells were infected with 10 PFU/cell of KD1 or KD1-SPB. At 24 h p.i., protein extracts were analyzed for E1A, E4ORF3, and ADP using specific antisera. The E1A proteins appear as multiple bands. ADP appears as two bands; the upper band is glycosylated and the lower band is a proteolytically cleaved species (Scaria et al., *Virology* 191:743-753, 1992; Tollefson et al., *J. Virol.* 66:3633-3642).

Figure 30 depicts immunofluorescence micrographs showing that KD1-SPB expresses E4ORF3 in H441 but not Hep 3B cells. Cells growing on coverslips were infected with 20 PFU/cell of KD1, KD1-SPB, or dl309 (wild-type). At 48 h (Panel A) or 6 days (Panel B), cells were fixed and stained with a rabbit polyclonal antipeptide antiserum against E4ORF3. Photographs were taken using a 100X Planapo lens. Each panel shows about 8 nuclei. This figure is part of the same experiment shown in Figure 31.

Figure 31 depicts immunofluorescence micrographs showing that KD1-SPB does not express E2-DBP or fiber efficiently in Hep 3B cells. Hep 3B cells were infected with 20 PFU/cell of KD1-SPB or KD1. At 48 h (A) or 6 days (B) p.i., cells were fixed and double-stained using a rabbit polyclonal antiserum against DBP and a mouse monoclonal antibody against fiber. The same fields are shown for DBP and fiber. This figure is part of the same experiment shown in Figure 30.

Figure 32 presents graphs illustrating that KD1-SPB lyses H441 but not Hep 3B as efficiently as KD1. H441 or Hep 3B cells were mock-infected or infected with 20 PFU/cell of KD1 or KD1-SPB. Cell lysis was determined by release of lactate dehydrogenase from the cells into the medium.

Figure 33 presents graphs illustrating that KD1-SPB suppresses growth of H441 tumors in nude mice equally as well as KD1. Tumor cells were injected into flanks of nude mice and allowed to grow to about 100 μ l (H441) or 150 μ l (Hep 3B) volumes. Tumors (n = 10) were injected with DMEM (mock) or with 5×10^7 PFU of KD1 or KD1-SPB. Injections of the viruses were repeated twice weekly for 3 weeks to a total dose of 3.0×10^8 PFU per tumor. Tumors were measured and the mean fold-increase in tumor size was calculated.

Description of the Preferred Embodiments

In accordance with the present invention, it has been discovered that overexpression of ADP by a recombinant adenovirus results in faster lysis of cells and spread of the virus throughout a cell monolayer than viruses expressing wild-type levels of ADP. It has also been discovered that this function for ADP is manifest in an adenovirus that contains E1A mutations that restrict adenoviral replication to neoplastic cells. Thus, vectors which are both replication competent in neoplastic cells and which overexpress ADP should be useful in anti-cancer therapy.

In the context of this disclosure, the following terms will be defined as follows unless otherwise indicated:

"Naturally-occurring" as applied to an object such as a polynucleotide, polypeptide, or virus means that the object can be isolated from a source in nature and has not been intentionally modified by a human.

"Neoplastic cell" means a cell which exhibits an aberrant growth phenotype characterized by a significant loss of control of cell proliferation and includes actively replicating cells as well as cells in a temporary non-replicative resting state (G_1 or G_2). A neoplastic cell may have a well-differentiated phenotype or a poorly-differentiated phenotype and may comprise a benign neoplasm or a malignant neoplasm.

"Recombinant virus" means any viral genome or virion that is different than a wild-type virus due to a deletion, insertion, or substitution of one or more nucleotides in the wild-type viral genome. The recombinant virus can have changes in the number of amino acid sequences encoded and expressed or in the amount or activity of proteins expressed by the virus. In particular, the term includes recombinant viruses generated by the intervention of a human.

"Replication-competent" as applied to a vector means that the vector is capable of replicating in normal and/or neoplastic cells. As applied to a recombinant virus, "replication-competent" means that the virus exhibits the following phenotypic characteristics in normal and/or neoplastic cells: cell infection; replication of the viral genome; and production and release of new virus particles; although one or more of these characteristics need not occur at the same rate as they occur in the same cell type infected by a wild-type virus, and may occur

at a faster or slower rate. Where the recombinant virus is derived from a virus such as adenovirus that lyses the cell as part of its life cycle, it is preferred that at least 5 to 25% of the cells in a cell culture monolayer are dead 5 days after infection. Preferably, a replication-competent virus infects and lyses at least 25 to 50%, more preferably at least 75%, and most preferably at least 90% of the cells of the monolayer by 5 days post infection (p.i.).

"Replication-defective" as applied to a recombinant virus means the virus is incapable of, or is greatly compromised in, replicating its genome in any cell type in the absence of a complementing replication-competent virus. Exceptions to this are cell lines such as 293 cells that have been engineered to express adenovirus E1A and E1B proteins.

"Replication-restricted" as applied to a vector of the invention means the vector replicates better in a dividing cell, i.e. either a neoplastic cell or a non-neoplastic, dividing cell, than in a cell of the same type that is not neoplastic and/or not dividing, which is also referenced herein as a normal, non-dividing cell. Preferably, a replication-restricted virus kills at least 10% more neoplastic cells than normal, non-dividing cells in cell culture monolayers of the same size, as measured by the number of cells showing cytopathic effects (CPE) at 5 days p.i. More preferably, between 25% and 50%, and even more preferably, between 50% and 75% more neoplastic than normal cells are killed by a replication-restricted virus. Most preferably, a replication-restricted adenovirus kills between 75% and 100% more neoplastic than normal cells in equal sized monolayers by 5 days p.i.

In one embodiment the invention provides a vector that is replication-competent in neoplastic cells and which overexpresses an ADP. Vectors useful in the invention include but are not limited to plasmid-expression vectors, bacterial vectors such as *Salmonella* species that are able to invade and survive in a number of different cell types, vectors derived from DNA viruses such as human and non-human adenoviruses, adenovirus associated viruses (AAVs), poxviruses, herpesviruses, and vectors derived from RNA viruses such as retroviruses and alphaviruses. Preferred vectors include recombinant viruses engineered to overexpress an ADP. Recombinant adenoviruses are particularly preferred for use as the vector, especially vectors derived from Ad1, Ad2, Ad5 or Ad6.

Vectors according to the invention overexpress ADP. As applied to recombinant Ad and AAV vectors, the term "overexpresses ADP" means that more ADP molecules are made per viral genome present in a dividing cell infected by the vector than expressed by any previously known recombinant adenoviral vector or AAV in a dividing cell of the same type. As applied to other, non-adenoviral vectors, "overexpresses ADP" means that the virus expresses sufficient ADP to lyse a cell containing the vector.

Vectors overexpressing ADP can be prepared using routine methodology. See, e.g., *A Laboratory Cloning Manual*, 2nd Ed., v 1. 3, Sambrook et al., eds., Cold Spring Harbor

Laboratory Press, 1989. For example, a polynucleotide encoding the ADP can be cloned into a plasmid expression vector known to efficiently express heterologous proteins in mammalian cells. The polynucleotide should also include appropriate termination and polyadenylation signals. Enhancer elements may also be added to the plasmid to increase the amount of ADP expression. Viral vectors overexpressing ADP can be prepared using similar materials and techniques.

Where the virus is a recombinant adenovirus, overexpression of ADP can be achieved in a multitude of ways. In general, any type of deletion in the E3 region that removes a splice site for any of the E3 mRNAs will lead to overexpression of the mRNA for ADP, inasmuch as more of the E3 pre-mRNA molecules will be processed into the mRNA for ADP. This is exemplified in the KD1, KD3, GZ1 and GZ3 vectors (SEQ ID NOS:1-4) whose construction is described below. Other means of achieving overexpression of ADP in Ad vectors include, but are not limited to: insertion of pre-mRNA splicing and cleavage/polyadenylation signals at sites flanking the gene for ADP; expression of ADP from another promoter, e.g. the human cytomegalovirus promoter, inserted into a variety of sites in the Ad genome; and insertion of the gene for ADP behind the gene for another Ad mRNA, together with a sequence on the 5' side of the ADP sequence that allows for internal initiation of translation of ADP, e.g. the Ad tripartite leader or a viral internal ribosome initiation sequence.

The ADP expressed by a vector according to the invention is any polypeptide comprising a naturally-occurring full-length ADP amino acid sequence or variant thereof that confers upon a vector expressing the ADP the ability to lyse a cell containing the vector such that replicated copies of the vector are released from the infected cell. A preferred full-length ADP comprises the ADP amino acid sequence encoded by Ad1, Ad2, Ad5 or Ad6. These naturally-occurring ADP sequences are set forth in SEQ ID NOS:5-8, respectively. ADP variants include fragments and deletion mutants of naturally-occurring adenovirus death proteins, as well as full-length molecules, fragments and deletion mutants containing conservative amino acid substitutions, provided that such variants retain the ability, when expressed by a vector inside a cell, to lyse the cell.

Conservative amino acid substitutions refer to the interchangeability of residues having similar side chains. Conservatively substituted amino acids can be grouped according to the chemical properties of their side chains. For example, one grouping of amino acids includes those amino acids having neutral and hydrophobic side chains (A, V, L, I, P, W, F, and M); another grouping is those amino acids having neutral and polar side chains (G, S, T, Y, C, N, and Q); another grouping is those amino acids having basic side chains (K, R, and H); another grouping is those amino acids having acidic side chains (D and E); another grouping is those amino acids having aliphatic side chains (G, A, V, L, and I); another

grouping is those amino acids having aliphatic-hydroxyl side chains (S and T); another grouping is those amino acids having amine-containing side chains (N, Q, K, R, and H); another grouping is those amino acids having aromatic side chains (F, Y, and W); and another grouping is those amino acids having sulfur-containing side chains (C and M). Preferred conservative amino acid substitutions groups are: R-K; E-D, Y-F, L-M; V-I, and Q-H.

As used herein, an ADP variant can also include modifications of a naturally-occurring ADP in which one or more amino acids have been inserted, deleted or replaced with a different amino acid or a modified or unusual amino acid, as well as modifications such as glycosylation or phosphorylation of one or more amino acids so long as the ADP variant containing the modified sequence retains cell lysing activity.

As described below, the inventors herein performed a structure-function analysis of ADP that defined specific domains in ADP required to promote cell death. Using this information, when combined with known recombinant DNA and cloning methodology, it is believed the skilled artisan can readily construct ADP variants of a naturally-occurring adenovirus death protein and test them for cell lysing activity. A preferred ADP deletion mutant comprises an ADP amino acid sequence from any of the deletion mutants *dl716*, *dl715*, *dl714* and *dl737*, whose ADP sequences are set forth in SEQ ID NOS:9-12, respectively).

Where the vector is derived from a virus, it is preferred that the virus lack expression of one or more viral proteins involved in avoiding host anti-viral defenses such as immune-mediated inflammation and/or apoptosis of infected cells. For example, adenovirus contains a cassette of genes that prevents killing of Ad-infected cells by the immune system (Wold et al., *Semin. Virol.*, 1998 (8:515-523, 1998). The E3-14.7K protein and the E3 RID (Receptor Internalization and Degradation) protein, which is a complex consisting of RID α and RID β , inhibit apoptosis of Ad-infected cells induced by tumor necrosis factor (TNF) and the Fas ligand which are expressed on, or secreted by, activated macrophages, natural killer (NK) cells, and cytotoxic lymphocytes (CTLs) (Tollefson et al., *Nature* 392:727-730, 1998). The E3-gp19K protein inhibits CTL-killing of infected cells by blocking transport of MHC class I antigens to the cell surface (Wold et al., *supra*). Thus, it is believed that infection of tumor cells by such viral vectors will stimulate infiltration of inflammatory cells and lymphocytes into the tumor, and will not prevent infected tumor cells from apoptosis induced by cytolytic cells of the immune system, or against apoptosis inducing cytokines. For example, it is known that when mice are infected with Ad mutants lacking the E3 gp19K, RID and 14.7K proteins there is a dramatic increase (as compared to E3-positive Ad) in infiltration of inflammatory cells and lymphocytes into the infected tissue (Sparer et al., *J. Virol.* 70:2431-2439, 1996). A similar infiltration of tumors infected by an ADP-expressing viral vector of

the invention would be expected to further promote destruction of the tumor by adding an immune system attack to the ADP-mediated killing activity. For example, it is believed that the viral infection will stimulate formation of tumor-specific CTL's that can kill neoplastic cells not only in the tumor but also ones that have metastasized. In addition, it is also
5 expected that vector-specific CTL's will be generated which could attack vector-infected cells if the vector spreads away from the tumor into normal cells. Because viral vectors overexpressing ADP will spread rapidly through the tumor, it is believed these immune mechanisms will have little effect on spread of the vector.

Where the vector is a recombinant adenovirus, it is preferred that the adenovirus lack
10 expression of each of the E3 gp19K, RID, and 14.7K proteins. By "lack expression" and "lacking expression" of a protein(s), it is meant that the viral genome contains one or more mutations that inactivates expression of a functional protein, i.e., one having all the functions of the wild-type protein. The inactivating mutation includes but is not limited to substitution or deletion of one or more nucleotides in the encoding gene(s) that prevents expression of
15 functional transcripts or that results in transcripts encoding nonfunctional translation products. A particularly preferred way to inactivate expression of the Ad E3 gp19K, RID, and 14.7K proteins is by deleting the E3 region containing the genes encoding these proteins. Preferably, one or both of the E3 genes encoding the E3 6.7K and 12.5K proteins are also deleted because, as discussed in the Examples below, it is believed that deletion of most or all
20 of the E3 genes other than the ADP gene facilitates overexpression of ADP mRNA by reducing competition for splicing of the major late pre-mRNAs. Preferred Ad vectors containing an E3 deletion that overexpress ADP are GZ1 (SEQ ID NO:3) and GZ3 (SEQ ID NO:4), whose construction and properties are described in the Examples below.

The invention also provides ADP-expressing vectors whose replication is restricted to
25 dividing cells. Any means known to provide such a replication-restricted phenotype may be used. For example, WO 96/40238 describes microbes that preferentially invade tumor cells as well as methods for identifying and isolating bacterial promoters that are selectively activated in tumors. It is also contemplated that expression of one or more vector proteins essential for replication can be placed under the control of the promoter for a cellular gene
30 whose expression is known to be upregulated in neoplastic cells. Examples of such genes include but are not limited to: the breast cancer markers mammaglobin (Watson et al., *Oncogene* 16:817-824, 1998); BRCA1 (Norris et al., *J. Biol. Chem.* 270:22777-22782, 1995) *her2/neu* (Scott et al., *J. Biol. Chem.* 269:19848-19858, 1994); prostate specific antigen (U.S. Patent 5,698,443); surfactant protein B for lung alveoli (Yan et al., *J. Biol. Chem.* 270:24852-
35 24857, 1995); factor VII for liver (Greenberg et al., *Proc. Natl. Acad. Sci. USA* 92:12347-12351, 1995); and survivin for cancer in general (Li et al., *Nature* 396:580-584). Where the

vector is an adenovirus, it is contemplated that such tumor-specific promoters can be substituted for the E4 promoter. Because E4 gene products are essential for Ad replication, placing their expression under the control of a tumor-specific promoter should restrict replication of the vector to tumor cells in which the promoter is activated.

5 Another strategy for restricting replication of ADP-expressing Ad vectors to neoplastic cells is exemplified by the KD1 (SEQ ID NO:1), KD2 (SEQ ID NO:13) and KD3 (SEQ ID NO:2) vectors, whose construction and properties are described in the Examples below. This strategy exploits a pre-existing Ad5 mutant in the E1A gene, named *d1101/1107* (Howe et al., *Proc. Natl. Acad. Sci.*, 87:5883-5887, 1990), also referred to herein as *d101/07*,
10 and which can only grow well in cancer cells. The role of E1A is to drive cells from the G₀ and G₁ phases of the cell cycle into S-phase. This is achieved by two mechanisms, one involving pRB (and family members), and the other involving p300 and the related protein CBP (DePinho, R.A., *Nature* 391:533-536, 1998). One domain in E1A binds members of the pRB family. pRB normally exists in the cell as a complex with the transcription factor E2F-1
15 and E2F family members (E2F), tethered via E2F to E2F binding sites in promoters of cells expressed in S-phase. Here, pRB acts as a transcriptional co-repressor. E1A binding to pRB relieves this repression, and causes the release of E2F from pRB/E2F complexes. Free E2F then activates promoters of genes expressed in S-phase, e.g. thymidine kinase, ribonucleotide reductase, etc. Another domain in E1A binds the p300/CBP transcription adaptor protein
20 complex. p300/CBP is a transcriptional co-activator that binds many different transcription factors and accordingly is targeted to promoters. p300/CBP has intrinsic histone acetyltransferase activity. E1A binding to p300/CBP is believed to inhibit this histone acetyltransferase activity, allowing acetylation of histones and repression of transcription (Chakravarti et al., *Cell* 96:393-403, 1999; Hamamori et al., *Cell* 96:405-413, 1999).
25 Conceivably, some of the genes that are repressed as a result of E1A interacting with p300/CBP to play a role in blocking the cell cycle, although this is not known. Cancer cells are cycling, so they have free E2F and presumably some p300/CBP-regulated genes are repressed. Consistent with these ideas, E1A must bind both p300/CBP and the pRB family in order to transform primary cells to a constitutively cycling state (Howe et al., *supra*). The
30 mutant *d101/07* lacks both the p300/CBP- and pRB-binding domains and, as expected, it replicates very poorly in non-dividing "normal" cells or serum-starved cancer cells, but well in growing cancer cells. As described below, the growth of the KD1 and KD3 vectors, which contain the *d101/07* E1A mutation, is very much better in dividing cancer cells as compared to non-dividing cells. Because the *d101/07* mutant is completely defective in oncogenic
35 transformation of rat cells (Howe et al., *supra*), vectors according to the invention that contain

this E1A mutation cannot induce cancer in humans (remote as that may be) through an E1A-dependent mechanism.

The invention also includes vectors overexpressing ADP whose replication is restricted to specific tissues by placing expression of one or more proteins essential for replication under the control of a tissue specific promoter and/or a tumor specific promoter. A number of tissue-specific and/or tumor specific promoters have been described in the art. Non-limiting examples include the surfactant protein B promoter, which is only active in cells containing the TTF1 transcription factor (i.e., type II alveolar cells (Yan et al., *supra*)), as described in U.S. Patent 5,466,596 to Breitman et al., which directs gene expression specifically in cells of endothelial lineage; prostate specific antigen which is expressed in prostate cells (Rodriguez et al., *supra*); human telomerase protein (hTERT) promoter (see, e.g., U.S. Patent No. 6,054,575); and human alpha-lactalbumin gene which is expressed in breast cancer cells (Anderson et al., *Gene Therapy* 6:854-864, 1999). Many other tissue-specific, tumor specific, or tissue-preferred enhancer/promoters have been reported (Miller and Whelan, *Human Gene Therapy* 8:803-815, 1997). As exemplified with the surfactant protein B promoter in Examples 6 and 10, vectors expressing tissue-specific promoters would be expected to show tissue specificity in viral replication, viral spreading, cell lysis, and tumor suppression.

Replication of vectors according to the invention can also be controlled by placing one or more genes essential for vector replication under the control of a promoter that is activated by an exogenous inducing agent, such as metals, hormones, antibiotics, and temperature changes. Examples of such inducible promoters include but are not limited to metallothionein promoters, the glucocorticoid promoter, the tetracycline response promoter, and heat shock protein (hsp) promoters such as the hsp 65 and 70 promoters.

The invention also provides compositions comprising a recombinant vector that overexpresses ADP in an amount effective for promoting death of neoplastic cells and a method comprising administering a therapeutically effective amount of the vector to a neoplastic cell in a patient. It is believed the compositions and methods of the present invention are useful for killing neoplastic cells of any origin and include neoplastic cells comprising tumors as well as metastatic neoplastic cells.

It is also contemplated that ADP-expressing viral vectors can be administered to neoplastic cells along with a replication-defective virus that expresses an anti-cancer gene product. For example, many replication-defective E1⁻ Ad vectors for use in cancer therapy are well characterized. A limitation of replication-defective vectors is that they only synthesize the therapeutic protein in the cell they initially infect, they cannot spread to other cells. Also, since the genome does not replicate, transcription can only occur from the input

genomes, and this could be as low as one copy per cell. In contrast, the genome of replication-competent Ad vectors are amplified by about 10^4 in the cell that was initially infected, providing more templates for transcription. More amplification is achieved as the vector spreads to other cells. By combining replication-defective viral vectors expressing an anti-cancer gene product with replication-competent viral vectors described herein, it is expected that the result will be template amplification and rapid spread of both vectors to surrounding cells. For example, with Ad-based vectors, the burst size for each vector should be large, $\sim 10^4$ PFU/cell, so the probability of co-infection of surrounding cells by both vectors will be high. Thus, both the replication-competent and replication-defective vectors should spread simultaneously through the tumor, providing even more effective anti-cancer therapy.

As an alternative method of delivering an anti-cancer gene product with an ADP overexpressing Ad vector, the anti-cancer gene can be engineered into any of the ADP overexpressing replication-competent vectors described herein, in order to provide both the ADP and the anti-cancer function in a single vector. The anti-cancer gene can be engineered into any appropriate location of the vector, as can be easily determined by the skilled artisan. For example, the anti-cancer gene can be engineered into the E3 region.

Expression of the anti-cancer gene product encoded by the replication-defective vector can be under the control of either constitutive, inducible or cell-type specific promoters. The anti-cancer gene product can be any substance that promotes death of a neoplastic cell. The term "gene product" as used herein refers to any biological product or products produced as a result of the biochemical reactions that occur under the control of a gene. The gene product can be, for example, an RNA molecule, a peptide, a protein, or a product produced under the control of an enzyme or other molecule that is the initial product of the gene, i.e., a metabolic product. For example, a gene can first control the synthesis of an RNA molecule which is translated by the action of ribosomes into a prodrug converting enzyme which converts a nontoxic prodrug administered to a cancer patient to a cell-killing agent; the RNA molecule, enzyme, and the cell-killing agent generated by the enzyme are all gene products as the term is used here. Examples of anti-cancer gene products include but are not limited to cell-killing agents such as apoptosis-promoting agents and toxins; prodrug converting enzymes; angiogenesis inhibitors; and immunoregulatory molecules and antigens capable of stimulating an immune response, humoral and/or cellular, against the neoplastic cell.

Apoptosis-promoting agents include but are not limited to the pro-apoptotic members of the BCL-2 family such as BAX, BAD, BID and BIK, as well as antisense molecules which block expression of anti-apoptotic members of the BCL-2 family. Examples of immunoregulatory molecules are cytokines such as tumor necrosis factor, Fas/Apo1/CD95

ligand, tumor necrosis factor related apoptosis inducing ligand, interleukins, macrophage activating factor and interferon γ . Angiogenesis inhibitors include but are not limited to endostatin and angiostatin. Toxins include but are not limited to tumor necrosis factor, lymphotoxin, the plant toxin ricin, which is not toxic to humans due to the lack of ricin
5 receptors in animal cells, and the toxic subunit of bacterial toxins. Examples of pro-drug converting enzymes and pro-drug combinations are described in WO 96/40238 and include thymidine kinase and acyclovir or gancyclovir; and bacterial cytosine deaminase and 5-fluorocytosine.

The therapeutic or pharmaceutical compositions of the present invention can be
10 administered by any suitable route known in the art including for example by direct injection into a tumor or by other injection routes such as intravenous, subcutaneous, intramuscular, transdermal, intrathecal and intracerebral. Administration can be either rapid as by injection or over a period of time as by slow infusion or administration of slow release formulation. For treating tissues in the central nervous system, administration can be by injection or
15 infusion into the cerebrospinal fluid (CSF). When it is intended that a recombinant vector of the invention be administered to cells in the central nervous system, administration can be with one or more agents capable of promoting penetration of the vector across the blood-brain barrier. Preferably, vectors of the invention are administered with a carrier such as liposomes or polymers containing a targeting moiety to limit delivery of the vector to targeted cells.
20 Examples of targeting moieties include but are not limited to antibodies, ligands or receptors to specific cell surface molecules.

Compositions according to the invention can be employed in the form of pharmaceutical preparations. Such preparations are made in a manner well known in the pharmaceutical art. One preferred preparation utilizes a vehicle of physiological saline
25 solution, but it is contemplated that other pharmaceutically acceptable carriers such as physiological concentrations of other non-toxic salts, five percent aqueous glucose solution, sterile water or the like may also be used. It may also be desirable that a suitable buffer be present in the composition. Such solutions can, if desired, be lyophilized and stored in a sterile ampoule ready for reconstitution by the addition of sterile water for ready injection.
30 The primary solvent can be aqueous or alternatively non-aqueous.

The carrier can also contain other pharmaceutically-acceptable excipients for modifying or maintaining the pH, osmolarity, viscosity, clarity, color, sterility, stability, rate of dissolution, or odor of the formulation. Similarly, the carrier may contain still other pharmaceutically-acceptable excipients for modifying or maintaining release or absorption or
35 penetration across the blood-brain barrier. Such excipients are those substances usually and customarily employed to formulate dosages for parenteral administration in either unit dosage

or multi-dose form or for direct infusion into the cerebrospinal fluid by continuous or periodic infusion.

It is also contemplated that certain formulations containing ADP-expressing vectors are to be administered orally. Such formulations are preferably encapsulated and formulated with suitable carriers in solid dosage forms. Some examples of suitable carriers, excipients, and diluents include lactose, dextrose, sucrose, sorbitol, mannitol, starches, gum acacia, calcium phosphate, alginates, calcium silicate, microcrystalline cellulose, polyvinylpyrrolidone, cellulose, gelatin, syrup, methyl cellulose, methyl- and propylhydroxybenzoates, talc, magnesium, stearate, water, mineral oil, and the like. The formulations can additionally include lubricating agents, wetting agents, emulsifying and suspending agents, preserving agents, sweetening agents or flavoring agents. The compositions may be formulated so as to provide rapid, sustained, or delayed release of the active ingredients after administration to the patient by employing procedures well known in the art. The formulations can also contain substances that diminish proteolytic degradation and promote absorption such as, for example, surface active agents.

The specific dose is calculated according to the approximate body weight or body surface area of the patient or the volume of body space to be occupied. The dose will also be calculated dependent upon the particular route of administration selected. Further refinement of the calculations necessary to determine the appropriate dosage for treatment is routinely made by those of ordinary skill in the art. Such calculations can be made without undue experimentation by one skilled in the art. Exact dosages are determined in conjunction with standard dose-response studies. It will be understood that the amount of the composition actually administered will be determined by a practitioner, in the light of the relevant circumstances including the condition or conditions to be treated, the choice of composition to be administered, the age, weight, and response of the individual patient, the severity of the patient's symptoms, and the chosen route of administration. Dose administration can be repeated depending upon the pharmacokinetic parameters of the dosage formulation and the route of administration used.

The invention also contemplates passively immunizing patients who have been treated with a viral vector overexpressing ADP. Passive immunization can include administering to the patient antiserum raised against the viral vector, or gamma-globulin or vector-specific purified polyclonal or monoclonal antibodies isolated from the antiserum. Preferably, the patient is passively immunized after a time period sufficient for the viral vector to replicate in and spread through the tumor.

Preferred embodiments of the invention are described in the following examples. Other embodiments within the scope of the claims herein will be apparent to one skilled in the

art from consideration of the specification or practice of the invention as disclosed herein. It is intended that the specification, together with the examples, be considered exemplary only, with the scope and spirit of the invention being indicated by the claims which follow the examples.

5

Example 1

This example illustrates the construction and characterization of the KD1 and KD3 anti-cancer vectors.

To construct KD1, the inventors deleted the entire E3 region of a unique plasmid, leaving behind only a unique *PacI* site for cloning. The starting plasmid was pCRII, purchased from Invitrogen, containing the Ad5 *Bam*HIA fragment having a deletion of all the E3 genes; the E3 deletion is identical to that for KD1 and GZ3, the sequences of which are given in SEQ ID NO:1 and SEQ ID NO:4, respectively. The ADP gene from Ad5 was cloned into the *PacI* site, then built into the E3 region of the genome of the Ad5 E1A mutant named *dI01/07*. This was done by co-transfecting into human embryonic kidney 293 cells the aforementioned *Bam*HIA fragment containing the ADP gene together with the overlapping *Eco*RIA restriction fragment obtained from *dI01/07*. Complete viral genomes are formed within the cell by overlap recombination between the Ad sequences in the *Bam*HIA fragment in the plasmid and the *Eco*RIA fragment. KD3 was constructed in the same way except the E3 gene for the 12.5K protein was retained in the starting plasmid. A vector named KD2, which marginally overexpress ADP, was also prepared. Plaques of each recombinant Ad were picked, screened, purified, expanded into CsCl-banded stocks, sequenced, titered, and characterized. GZ1 and GZ3 are Ad vectors that are identical to KD1 and KD3, respectively, except that GZ1 and GZ3 have wild-type E1A sequences as found in AD5 or in the Ad5 mutant *dI309*. GZ1 and GZ3 were constructed as described for KD1 and KD3 except that the *Eco*RIA fragment of Ad5 was used for GZ1 and GZ3.

KD1 and KD3 were characterized in cell culture by infecting the human A549 lung carcinoma cell line with high titer ($1-8 \times 10^{10}$ plaque forming units [PFU] per ml) virus stocks of one of these recombinant vectors, or with one of the control viruses *dI01/07*, *dI309*, *dI327*, and Ad5 (wt). Fifty PFU per cell were used for each virus. The descriptions of these viruses as well as some other viruses used in these examples are presented in Table 1.

30

Table 1: Description of mutations in viruses:

us	RNA				REGION	
	E1	VA	E3	E4		
101/1107	<i>dl</i> 1101: deletion of Ad5 bp 569-634 <i>dl</i> 1107: deletion of Ad5 bp 890-928	From <i>dl</i> 309 deletion of Ad5 bp 10594-10595	From <i>dl</i> 309 deletion of Ad5 bp 28597-28602; deletion-substitution Ad5 bp 3005-30750, insert 642 bp DNA of unknown origin	wild type		
11	<i>dl</i> 1101: deletion of Ad5 bp 569-634 <i>dl</i> 1107: deletion of Ad5 bp 890-928	From <i>dl</i> 309 deletion of Ad5 bp 10594-10595	deletion of Ad5 bp 27858-2760, TAA inserted; deletion of Ad5 bp 27982-28134; deletion of Ad5 bp 28395-29397, insert CCTTAATTAAA; deletion of Ad5 bp 29783-30883, insert TTAATTAAAG	wild type		
12	<i>dl</i> 1101: deletion of Ad5 bp 569-634 <i>dl</i> 1107: deletion of Ad5 bp 890-928	From <i>dl</i> 309 deletion of Ad5 bp 10594-10595	<i>dl</i> 309 background, gp19K mutated deletion of Ad5 bp 28597-28602; deletion-substitution Ad5 bp 3005-30750, insert 642 bp DNA of unknown origin; deletion of Ad5 bp 28788-28789, insert TTAATTAA	wild type		
13	<i>dl</i> 1101: deletion of Ad5 bp 569-634 <i>dl</i> 1107: deletion of Ad5 bp 890-928	From <i>dl</i> 309 deletion of Ad5 bp 10594-10595	deletion of Ad5 bp 28598-29397; deletion of Ad5 bp 29783-30469	wild type		
14	<i>wt</i>	wild type	deletion of Ad5 bp 27858-2760, TAA inserted; deletion of Ad5 bp 27982-28134; deletion of Ad5 bp 28395-29397, insert CCTTAATTAAA; deletion of Ad5 bp 29783-30883, insert TTAATTAAAG	wild type		

	wild type	wild type	deletion of Ad5 bp 28598-29397; deletion of Ad5 bp 29783-30469	wild type
01/1107-	<i>dl1101</i> : deletion of Ad5 bp 569-634 <i>dl1107</i> : deletion of Ad5 bp 890-928	From <i>dl309</i> deletion of Ad5 bp 10594-10595	From <i>dl309</i> deletion of Ad5 bp 28597-28602; deletion-substitution Ad5 bp 3005-30750, insert 642 bp DNA of unknown origin	E4 promoter deletion-substitution: deletion of Ad5 bp 35623-35775, insert SP-B 500 promoter flanked by BstI 1071 sites
I-SPB	<i>dl1101</i> : deletion of Ad5 bp 569-634 <i>dl1107</i> : deletion of Ad5 bp 890-928	From <i>dl309</i> deletion of Ad5 bp 10594-10595	deletion of Ad5 bp 27848-2760, TAA inserted; deletion of Ad5 bp 27982-28134; deletion of Ad5 bp 28395-29397, insert CCTTAATTAAA; deletion of Ad5 bp 29783-30883, insert TTAATTAAAGG	E4 promoter deletion-substitution: deletion of Ad5 bp 35623-35775, insert SP-B 500 promoter flanked by BstI 1071 sites
I-SPB	<i>dl1101</i> : deletion of Ad5 bp 569-634 <i>dl1107</i> : deletion of Ad5 bp 890-928	From <i>dl309</i> deletion of Ad5 bp 10594-10595	deletion of Ad5 bp 28598-29397; deletion of Ad5 bp 29783-30469	E4 promoter deletion-substitution: deletion of Ad5 bp 35623-35775, insert SP-B 500 promoter flanked by BstI 1071 sites

Using a polymerase chain reaction (PCR)-based protocol, an in-frame stop codon was introduced into the gene for the E3-gp19K protein in the E3 region of the Ad5 mutant dl309 (Jones and Shenk, *Cell* 17:683-689, 1979). The mutagenesis was conducted using a *SunI*-*Bst*1107I fragment, nucleotides 28,390 to 29,012 in the Ad5 genome, which was then substituted for the equivalent fragment in *dl*309. *dl*01/07 is the parent for KD1 and KD3. In turn, the Ad5 mutant named *dl*309 is the parent of *dl*01/07, i.e. *dl*309 is identical to *dl*01/07 except that *dl*309 does not have the E1A mutation. Both *dl*01/07 and *dl*309 have deletions of the genes for the E3 RID α , RID β and 14.7K proteins but retain the gene for ADP. The Ad5 mutant *dl*327 has wild-type E1A, it lacks the gene for ADP, and it lacks all other E3 genes except the one for the 12.5K protein.

At 24 and 36 hours post-infection (h p.i.), proteins were extracted from the A549 cells and analyzed for ADP by immunoblot using a rabbit antiserum against ADP (Tollefson et al., *J. Virol.* 66:3633-3642, 1992). The results are shown in Figure 2. Much more ADP was detected at 24 and 36 h p.i. in KD1- and KD3-infected cells than in cells infected with *dl*01/07. Also, much more ADP was synthesized by GZ1 and GZ3 than *dl*309 or the other viruses. Most importantly, KD1, KD3, GZ1, and GZ3 expressed much more ADP at 24 h p.i. than did *dl*01/07 or *dl*309 (Fig. 2). This result is consistent with an observation discussed below that the cells infected with KD1, KD3, GZ1, or GZ3 lyse faster, and that these viruses spread from cell to cell faster than *dl*01/07 or *dl*309. It is noteworthy that KD1, KD3, GZ1, and GZ3 express much more ADP at 24 and 36 h p.i. than the Ad5 mutant *dl*1520 (Fig. 2); *dl*1520 is the original name given to ONYX-015 (Heise et al., *Nature Medicine* 3:639-645, 1997). As expected, no ADP was detected in cells infected with *pm*734.1 (Fig. 2), a mutant that lacks amino acids 1 to 48 in ADP (Tollefson et al., *J. Virol.* 70:2296-2306, 1996). Expression of the E1A proteins by *dl*01/07, KD1, KD2, and KD3 was slightly less than by Ad5, *dl*309, or *dl*327, and as expected from the *dl*01/07 deletion, the proteins were smaller (Fig. 3A). *dl*327 is isogenic with *dl*324 (Thimmappaya et al., 1982 *Cell* 31:543-51, 1983), and it lacks the gene for ADP and all other E3 proteins except the 12.5K protein.

The amount of ADP detected in the KD1 and KD3 infected cells is significantly higher than the amount detected in the *dl*309 infected cells (Fig. 2). If one takes into consideration the fact that the viruses with the E1A mutation replicate somewhat slower, as evidenced in by the delayed appearance of the late proteins (Fig. 3B), it is clear that KD1 and KD3 express much more ADP per viral genome present in the cell than *dl*309. This finding is supported by the fact that when A549 cells are coinfectd with a virus containing the E1A mutation and *dl*327, which lacks ADP but has wild-type E1A, the replication rates of the E1A mutant viruses speed up, as indicated by earlier appearance of late proteins (compare Figs. 3B

and 3D). Thus, *dl327* complements the E1A mutation. In conclusion, these experiments demonstrate that ADP is dramatically overexpressed by KD1, KD3, GZ1, and GZ3. ADP is marginally overexpressed by KD2 (not shown).

Example 2

5 This example illustrates that KD1 and KD3 lyse cells more rapidly and spread from cell-to cell faster than other adenoviruses.

The ability of KD1 and KD3 to lyse cells was examined by a trypan blue exclusion cell viability assay which was performed essentially as described by Tollefson et al., *J. Virol.* 70:2296-2306, 1996. In brief, A549 cells were mock-infected or infected with 20 PFU/cell of
10 KD1, KD3, *dl01/07*, *dl327* or *dl309*. At various days p.i., the number of viable cells was determined using a hemocytometer (600 to 1000 cells were counted per time point) and the results are shown in Fig. 4.

Only 25% of the KD1-infected cells and 9% of the KD3-infected cells were alive at 5 days p.i. as compared to 44% of cells infected with *dl01/07*, which has the same E1A
15 mutation as KD1 and KD3. The KD1 and KD3 vectors also lysed cells faster than *dl309*, which has a wild-type E1A region. When infected with *dl327* (ADP⁺, E1A⁺), 94% of the cells were alive after 5 days. When cell lysis was estimated by release of lactate dehydrogenase, KD1 and KD3 once again lysed cells faster than *dl01/07* and *dl309*, and *dl327* caused little cell lysis (data not shown). Thus, ADP is required for efficient cell lysis, and over-expression
20 of ADP increases the rate of cell lysis.

As another means to measure cell lysis and to examine virus replication in cancer cells, separate groups of A549 cells were infected with 20 PFU/cell of KD1, KD3, *dl01/07*, or *dl309* and the amount of intracellular and extracellular virus was determined by plaque assay on A549 cells. At 2 days p.i., the total amount of virus formed in each group was similar, 2-4
25 $\times 10^8$ PFU/ml, indicating that replication of all the viruses is similar. However, when the ratio of extracellular to intracellular virus was calculated, the value for KD1 and KD3 was 2-3 logs higher than for Ad5, *dl309*, or *dl01/07* (data not shown). Thus, virus is released much more rapidly from cells infected with KD1 and KD3, which overexpress ADP, than with viruses expressing wild-type amounts of ADP.

30 The ability of KD1 and KD3 to spread from cell-to-cell was measured in a "cell spreading" assay. In this assay monolayers of A549 cells in a 48 well culture dish were mock-infected or infected with 10^{-3} , 10^{-2} , 10^{-1} , 10^0 , or 10 PFU/cell of *dl327*, *dl309*, Ad5, *dl01/07*, KD1 or KD3. At low PFU/cell, the viruses must go through two or three rounds of replication in order to infect every cell in the monolayer. At 1.0 and 10 PFU/cell, the
35 monolayer should be destroyed by the virus that initially infected the cells. To assess the

amount of spread in the monolayers by 7 days p.i., crystal violet, which stains live cells but not dead cells, was added to the monolayers. The results are shown in Fig. 5.

Remarkably, at 7 days p.i., the monolayer was virtually eliminated by KD1 and KD3 at 10^{-3} PFU/cell, whereas 1.0 PFU/cell was required with *dI01/07*, *dI309* and Ad5. This result attests to the potency of ADP in mediating cell lysis and virus spread in A549 cells. KD1 and KD3 are also more effective than *dI01/07* in killing other types of human cancer cell lines (most purchased from the American Type Culture Collection [ATCC]) as determined in this cell spreading assay. KD1 and/or KD3 killed HeLa (cervical carcinoma), DU145 (prostate), and pC3 (prostate) cells at 10^{-2} PFU/cell, ME-180 (cervix) and Hep3B (liver) at 10^{-1} PFU/cell, and U118 (glioblastoma) and U373 (glioblastoma) at 10 PFU/cell. From 10- to 100-fold more *dI01/07* was required to kill these cells (data not shown). These results indicate that KD1 and KD3 may be effective against many types of cancer.

An important aspect of the finding that ADP overexpressing vectors lyse cells at very low multiplicities of infection is that the multiplicity of infection in human tumors is likely to be low at sites distal to the sight of vector injection or distal to blood vessels that carry the vector to the tumor. Thus, ADP overexpressing vectors have an advantage over vectors that express less ADP or no ADP at all.

Example 3

This example illustrates that KD1 and KD3 replicate poorly in non-growing non-cancerous cells. The replication phenotype of KD1 and KD3 was evaluated using "normal" HEL-299 human fibroblast cells, either growing in 10% serum or rendered quiescent using 0.1% serum. All Ads should replicate well in growing cells, but viruses with the *dI01/07* E1A mutation should do poorly in quiescent cells because E1A is required to drive them out of G_0 . *dI309*, which has wild-type E1A, should replicate well in both growing and growth-arrested cells.

Cells were infected with 100 PFU/cell of KD1, KD3, *dI01/07*, or *dI309*. At different days p.i., virus was extracted and titered. In 10% serum, KD1, KD3, and *dI01/07* replicated well, reaching titers of 10^6 - 10^7 PFU/ml, only slightly less than *dI309* (Fig. 6). However, in quiescent cells, replication of KD1, KD3, and *dI01/07* was 1.5-2 logs lower than in growing cells, ranging from 10^4 to 2×10^5 PFU/ml. The titer of *dI309* reached 10^7 PFU/ml, nearly the level achieved in growing cells. At 10 days p.i., quiescent HEL-299 cell monolayers infected with 100 PFU/cell of KD1, KD3, or *dI01/07* were intact, whereas those infected with *dI309* or *dI327*, which have wild-type E1A, showed strong typical Ad cytopathic effect indicative of cell death (data not shown). Thus, replication of KD1 and KD3 is severely restricted to growing cell lines.

The restriction associated with the *dI01/07* E1A mutation was also tested in primary human cells (purchased from Clonetics) growing as monolayers. Bronchial epithelial cells (Fig. 7) and small airway epithelial cells were not killed by 10 PFU/cell of KD1, KD3, or *dI01/07* at 5 days p.i., whereas they were killed by 10 PFU/cell of *dI309* or *dI327* (data not shown). Lung endothelial cells also were not killed after 10 days by KD1, KD3, or *dI01/07* at 10 PFU/cell, but they were killed by 1 PFU/cell of *dI309*. These monolayers were subconfluent when initially infected, then grew to confluency. The exciting result here is that although these primary cells were growing, they did not support replication in this time frame and were not killed by KD1 or KD3. Thus, it is believed these vectors will be restricted to cancerous cells, and will have little to no effect on cells such as basal cells that are normally dividing in the body. In addition, it is unlikely that KD1 and KD3 will affect dividing leukocytes because such cells are poorly infected by Ad.

In summary, the above experiments demonstrate that KD1 and KD3 lyse cancer cells, spread from cell-to-cell rapidly, and replicate poorly in quiescent and non-cancerous cells. These properties should make them useful in anti-cancer therapy.

Example 4

This example illustrates that KD1 and KD3 inhibit the growth of human tumors in an animal model.

We could not evaluate mouse or rat tumors in normal mice or rats because they are totally non-permissive. Human cancer cell lines growing in nude mice have been used by Onyx Pharmaceuticals (Richmond, CA) to evaluate the efficacy of ONYX-015, an Ad vector lacking expression of the E1B 55 kDa protein (Heise et al., *Nature Med.* 3:639-645, 1997). We have found that A549 cells, which were used in many of our cell culture studies, form excellent rapidly growing solid tumors when injected subcutaneously into nude mice. The average tumor reaches ca. 500 μ l in four weeks, and is encapsulated, vascularized, and attached to the mouse skin (usually) or muscle.

Nude mice were inoculated into each hind flank with 2×10^7 A549 cells. After 1 week tumors had formed, ranging in size from about 20 μ l to 50 μ l. Individual tumors were injected three days later, and at subsequent weeks for 4 weeks (total of 5 injections), with 50 μ l of buffer or 50 μ l of buffer containing 5×10^7 PFU of *dI309*, *dI01/07*, KD1, KD3, or *pm734.1*, with a total virus dose per tumor of 3×10^8 PFU. The mutant *pm734.1* lacks ADP activity due to two nonsense mutations in the gene for ADP, but all other Ad proteins are expected to be synthesized at wild-type levels (Tollefson et al., *J. Virol.* 70:2296-2306, 1996). The efficacy of each virus (or buffer) was tested on six tumors. At weekly intervals, the length (L) and width (W) of tumors were measured using a Mitutoyo digital caliper. Tumor

volumes were calculated by multiplying $L \times W \times W/2$. This value was divided by the tumor volume at the time of the initial virus injection, the fold-increase in tumor growth was calculated, and the average for the six tumors was graphed.

As shown in Fig. 8A, tumors that received buffer continued to grow, increasing about 14-fold by 5 weeks. In contrast, tumors injected with *dI309*, which expresses normal amounts of ADP and lacks the E3 RID and 14.7K and proteins, only grew about 2.5-fold by 5 weeks. With *pm734.1*, which lacks ADP, the tumors grew as well as those that received buffer. Thus, *dI309* markedly decreases the rate of tumor growth, and ADP is required for this decrease. Tumors inoculated with *dI01/07* grew about 8-fold over 5 weeks. Since *dI01/07* is identical to *dI309* except for the E1A mutation, this result indicates that the E1A mutation significantly reduces the ability of Ad to prevent growth of the tumors. This effect is probably due to a reduction in virus replication in the tumors resulting in lower ADP expression, but it could also reflect other properties of E1A in the tumor cells, e.g. the inability of the mutant E1A proteins to induce apoptosis. Most importantly, tumors inoculated with KD1 or KD3 only grew about 2.5-fold. Thus, the overexpression of ADP by KD1 and KD3 allows KD1 and KD3 to reduce tumor growth to a rate markedly slower than *dI01/07* (their parental control virus), and even to a rate similar to that of *dI309*.

The finding that KD1 and KD3 are as effective as wild-type Ad (i.e. *dI309*) in reducing the rate of A549 tumor growth is highly significant in the context of cancer treatment, inasmuch as KD1 and KD3 are restricted to cancer cells whereas wild-type Ad does not have such a restriction.

The tumors in Fig. 8A received five injections of vectors, but only one dose of vector, in this case 5×10^8 of each of KD3 or GZ3, is sufficient to significantly reduce the rate of A549 tumor growth (Fig. 8B).

We have also found that KD1 and KD3 reduce the rate of growth in nude mice of a human liver cancer cell line, Hep3B cells. These cells form rapidly growing tumors that are highly vascularized. Nude mice were inoculated into each hind flank with 1×10^7 of Hep3B cells. After tumors reached about 100 μ l, they were injected twice per week for 3 weeks with 50 μ l of buffer or 5×10^7 PFU of KD1, KD3, or *dI309*. There were typically 8-10 tumors per test virus. The tumor sizes were measured and the fold increase in size at 0 to 3.5 following the initial virus injection was graphed as described above for the A549 tumors. Tumors that received buffer alone grew 9-fold over 3 weeks and were projected to grow about 12-fold over 3.5 weeks (after 3 weeks the mice had to be sacrificed because the tumors were becoming too large) (Fig. 9). Tumors that received KD1 or KD3 grew about 4-fold, establishing that KD1 and KD3 reduce the growth of Hep3B tumors in nude mice. Tumors

that were injected with *dI309* grew 2-fold (Fig. 9). The finding that KD1 and KD3 were somewhat less effective than *dI309* is probably due to the fact that they do not grow as well as *dI309* in Hep3B cells, as indicated by a cell spread assay in culture (data not shown). In any case, the important points are that KD1 and KD3 are effective against the Hep3B tumors, and
5 that they contain the E1A mutation that limits their replication to cancer cells.

These results point to the potency of ADP as an anti-tumor agent when expressed in an Ad vector. It is highly probable that KD1 and KD3 will provide significant clinical benefit when used to infect tumors growing in humans.

Example 5

10 This example illustrates the use of replication-defective Ad vectors in combination with KD1 or KD3.

It is well established that replication-competent (RC) viruses complement replication-defective (RD) mutants. That is, when the same cell is infected, the competent virus will supply the protein(s) that cannot be made from the mutant genome, and both viruses will
15 grow. To test the ability of KD1 and KD3 to complement RD viruses, two RD vectors expressing β -galactosidase were constructed. The first, named Ad- β -gal, has a cDNA encoding β -gal under the control of the Rous Sarcoma Virus promoter substituted for the deleted E1 region. Ad- β -gal also has the E3 region deleted, including the gene for ADP. The second, named Ad- β -gal/FasL is identical to Ad- β -gal, except that it also expresses murine
20 FasL from the human cytomegalovirus promoter/enhancer. These vectors were constructed by overlap recombination in human 293 cells that constitutively express the Ad E1A and E1B genes and complement replication of the E1-minus vectors.

These RD vectors should infect and express β -gal in A549 cells, but should not replicate because the E1A proteins are lacking. However, the vectors should replicate when
25 cells are co-infected with RC Ads. To prove this, A549 cells were infected with 10 PFU/cell of Ad- β -gal alone, or with 10 PFU/cell of Ad- β -gal plus 10 PFU/cell of KD1, KD3, *dI01/07*, *dI309*, or *dI327*. At 2 days p.i., virus was extracted and Ad- β -gal titers determined by β -gal expression in A549 cells. The yields are shown in Table 2 below.

Table 2

Virus	Yield (blue plaques per ml)
Ad- β -gal	1×10^2
Ad- β -gal + KD1	2×10^5
Ad- β -gal + KD3	3×10^5
Ad- β -gal + <i>dI01/07</i>	4×10^4
Ad- β -gal + <i>dI309</i>	3×10^5
Ad- β -gal + <i>dI327</i>	3.0×10^5

The data in Table 2 indicate that the complementing viruses increased the yield of Ad- β -gal by about 10^3 .

5 A key feature of KD1 and KD3 is that they spread from cell-to-cell faster than other Ads. Accordingly, they should complement the spread of Ad- β -gal. To test this, an infectious center assay was conducted. A549 cells were infected with Ad- β -gal plus KD1, KD3, or *dI01/07*. After 2 h, cells were collected, diluted, and seeded onto monolayers of fresh A549 cells. After 4 days, the cells were stained with X-gal and the results are shown in
10 Fig. 10.

With Ad- β -gal alone, only the originally infected cell (before seeding) should be stained, and the vector should not spread to other cells on the seeded monolayer. This was indeed the case. In monolayers seeded with A549 cells infected with Ad- β -gal alone (dish shown in the top left of Fig. 10A) contained a number of individual blue cells (not visible in the print); examples are shown in the enlarged view Fig. 10B. However, when the
15 monolayers were seeded with A549 cells coinfecting with Ad- β -gal and KD1 or KD3, there were numerous "comets" of blue cells (Fig. 10A). Each comet represents Ad- β -gal which has spread from one initially-infected cell. Most of the cells within a comet were stained with X-gal (Fig. 10C). Comets were also observed with *dI01/07*, but not to the extent of KD1 and
20 KD3 (Fig. 10A). With *dI327* (ADP), there was little spread from the originally infected cell (data not shown). In summary, KD1 and KD3 not only complement the replication of Ad- β -gal, they also enhance its rapid spread.

It is expected that KD1 and KD3 will also complement and enhance the spread of RD vectors expressing anti-cancer therapeutic gene products, and this expectation can be readily

verified using the Ad- β -gal/FasL in replication and infectious center assays as described above.

KD1 and KD3 not only complement the replication of RD vectors in cell culture, they also do so in Hep3B tumors growing in the hind flanks of nude mice. The RD vector used was AdLuc, an Ad that lacks the E1 and E3 regions, and has inserted into the E1 region an expression cassette where the firefly luciferase gene is expressed from the Rous Sarcoma Virus promoter (Harrod et al., *Human Gene Therapy* 9:1885-1898, 1998). The Hep3B tumors were injected with 1×10^7 PFU of AdLuc plus buffer, or 1×10^7 PFU of AdLuc plus 5×10^7 PFU of KD1, KD3, *dI01/07*, or *dI309*. After 2 weeks, mice were sacrificed and tumors excised. Proteins were extracted from the tumors and luciferase activity determined using a luminometer. The luciferase counts per tumor were 6,800 for AdLuc plus buffer, 113,500 for KD1, and 146,900 for KD3 (Fig. 11). Thus, KD3 and KD1 respectively caused a 22-fold and 17-fold increase in luciferase activity. This increase could be due to elevated synthesis of luciferase in cells that were initially coinfecting the AdLuc and KD1 or KD3, and it could also be due to spread of AdLuc from cell to cell in the tumor as mediated by KD1 or KD3.

In summary, infecting a tumor with a replication-competent ADP-overexpressing vector according to the invention together with a RD vector expressing an anti-cancer gene product should greatly increase the amount of anti-cancer protein synthesized in the tumor thereby increasing the ability of the replication-defective vector to promote destruction of the tumor.

Example 6

This example illustrates the construction and characterization of a recombinant Ad vector according to the invention which is replication-restricted to cancerous type II alveolar cells.

As demonstrated above, the *dI01/07* mutation in KD1 and KD3 limits growth of these vectors to cancer cells. To further restrict their replication phenotype, the E4 promoter in each virus was deleted and replaced by the surfactant protein B (SPB) promoter to produce vectors named KD1-SPB (SEQ ID NO:14), KD3-SPB (SEQ ID NO:15), and *dI01/07*-SPB (SEQ ID NO:16). The SPB promoter is only active in cells containing the TTF1 transcription factor, which has thus far been found primarily in type II alveolar cells of the human lung (Lazzaro et al., *Development* 113:1093-1104, 1991). Thus, KD1-SPB, KD3-SPB, and *dI01/07*-SPB should be severely restricted to cancerous type II alveolar cells of the human lung. Many lung cancers are of this type.

The KD1-SPB and KD3-SPB vectors were prepared as follows. The E4 promoter is located at the right end of the Ad genome (Fig. 1). Using a pCRII-based plasmid (Invitrogen)

containing the Ad5 DNA sequences from the BamHI site (59 map units) to the right hand end of the genome, and using a PCR-based protocol, nearly all the transcription factor binding sites were deleted from the E4 promoter Ad5 base pairs 35,623 to 35,775 and replaced with a 500 base pair fragment containing the SPB promoter (Yan et al., *J. Biol. Chem.* 270:24852-24857, 1995). The final plasmids contain the E4-SPB substitution in the E4 region and the *d*/01/07, KD1, or KD3 versions of the E3 region, respectively, for the viruses *d*/01/07-SPB, KD1-SPB, and KD3-SPB. These plasmids were co-transfected into 293 cells with a fragment containing the left portion of the genome of *d*/01/07, and plaques were allowed to develop. Plaques were screened for the expected features, purified, then expanded into a stock.

The A549-TTF1 cell line was developed in order to test the prediction that replication of *d*/01/07-SPB, KD1-SPB, and KD3-SPB would be restricted to cancerous cells expressing the TTF1 transcription factor. These cells were co-transfected with two plasmids, one in which TTF1 is expressed from the CMV promoter, and the other coding for resistance to neomycin. Resistant clones were isolated and shown to express TTF1 activity as determined by transient transfection with a plasmid expressing chloramphenicol acetyltransferase from the TTF1-requiring surfactant protein C promoter.

KD1-SPB and KD1 were subjected to a standard plaque development assay on A549-TTF1 cells and parental A549 cells. The results are shown in Fig. 12. With KD1-SPB on A549 cells, plaques were not visible after 8 days, only about 4% of the final number of plaques were seen after 10 days, and about 50% of final plaques were seen after 12 days. With KD1-SPB on A549-TTF1 cells, plaques were visible after 6 days, and about 60% of plaques were seen after 10 days. Thus, as expected, KD1-SPB grew significantly faster on the cells containing TTF1. KD1 formed plaques more quickly than KD1-SPB on both A549 and A549-TTF1 cells, indicating that the E4 promoter-SPB substitution is not as effective the wild-type E4 promoter in inducing Ad replication. However, this difference between KD1-SPB and KD1 on A549-TTF1 cells is tolerable, with KD1-SPB delayed only about 1 day. Curiously, the final titer obtained for all virus stocks by day 16 was similar, indicating that A549 cells may contain a very small amount of endogenous TTF1 activity. It is predicted that KD3-SPB and *d*/01/07-SPB will behave similarly to KD1-SPB when grown in A549-TTF1 cells and A549 cells.

The restriction of KD1-SPB to cells containing TTF1 was further examined in a cell spread assay using H441 cells, a TTF1-expressing human pulmonary adenocarcinoma cell line (Yan et al., *supra*), and Hep3B cells, a liver cancer cell line not expected to express TTF1. Culture dish wells containing H441 or Hep3B cells were infected with KD1-SPB or KD1 at multiplicities ranging from 10 to 10⁻⁴ PFU/cell. The H441 and Hep3B cells were

stained with crystal violet at 5 days and 8 days p.i., respectively. KD1-SPB and KD1 grew and spread equally well on H441 cells, causing destruction of the monolayer at 10^{-1} PFU per cell (Fig. 13). (Some of the H441 monolayer has peeled off in the well with KD1-SPB at 10^{-2} PFU per cell, and in the wells with KD1 and KD1-SPB at 10^{-4} PFU per cell; this occasionally occurs in cell spread assays, and it does not reflect virus infection). With Hep3B cells, KD1 grew and spread very much better than KD1-SPB, with 10^{-2} PFU per cell of KD1 causing more destruction of the monolayer as 1.0 PFU per cell of KD1-SPB (Fig. 13).

In summary, this example demonstrates that a replication-competent Ad, which replicates well on cells expressing the appropriate transcription factor, can be constructed with a tissue-specific promoter substituted in place of the E4 promoter. This methodology should be applicable to many other tissue specific and cell type specific promoters. One possibility would be a liver-specific promoter. Another possibility would be to use the E2F promoter, or another promoter with E2F sites, inasmuch as that promoter would be active only in cells such as cancer cells that have free E2F. A third possibility would be to use a regulatable promoter, e.g. the synthetic tetracycline response promoter (Massie et al., *J. Virol.* 72:2289-2296, 1998), where the activity of the promoter is controlled by the level of tetracycline or a tetracyclin analog in the patient.

Example 7

This example illustrates the construction and characterization of vectors which overexpress ADP and are not replication restricted.

As demonstrated above, the *dI01/07* E1A mutation in KD1 and KD3 is attenuating, inhibiting growth in non-dividing and even in dividing primary human epithelial and endothelial cells. Ads with this mutation are able to replicate well in dividing cancer cells. However, replication of such E1A mutants is not as efficient as, e.g. *dI309* which has a wild-type E1A gene. For instance, the rate of replication of *dI01/07*, as determined by the rate at which plaques develop, is reduced such that *dI01/07* plaques appear one day later than those of *dI309* (data not shown). This delay is due in part to a delay in expression of Ad late genes (see Fig. 3). The idea that the *dI01/07* mutation retards the rate of replication in A549 cells is further supported by the data in Fig. 8A, where *dI01/07* did not prevent tumor growth nearly as well as *dI309*. Despite this negative effect of the *dI01/07* E1A mutation, there are theoretical and practical aspects of having this mutation in the KD1 and KD3 vectors, as has been discussed. Nevertheless, one can easily imagine scenarios (e.g. patients with terminal cancer) where the ability of an Ad vector to destroy the tumor supercedes the requirement that the vector be totally restricted to tumor cells. In such cases, it would be advantageous to have vectors similar to KD1 and KD3, but with the wild-type E1A gene. The rates at which such

vectors express their genes, lyse cells, and spread from cell to cell should be higher than those of KD1 and KD3. Such vectors might cause some damage to non-cancerous cells and tissue, but this is also true for other modes of anti-cancer treatment such as surgery, chemotherapy, and radiation therapy.

5 In light of these considerations, vectors named GZ1 and GZ3 have been constructed that are identical to KD1 and KD3, respectively, except they have a wild-type E1A region. These vectors were constructed by overlap recombination in A549 cells. The left hand fragment contained the wild-type E1A region of Ad5, and the right end fragment contained the E3 modifications of KD1 or KD3. Plaques were picked, analyzed for the expected
10 genotype, plaque-purified, and expanded into CsCl-banded stocks. The titers of these stocks on A549 cells were 2.9×10^{10} PFU/ml for GZ1 and 1.6×10^{11} PFU/ml for GZ3. Thus, these vectors can be grown into high titer stocks comparable to wild-type Ad. The GZ1 and GZ3 plaques are larger and appear much sooner than the plaques for *dl309*. Large rapidly-appearing plaques reflect the ability of Ad to lyse cells and spread from cell-to-cell (Tollefson
15 et al., *J. Virol.* 70:2296-2306, 1996; Tollefson et al., *Virology* 220:152-162, 1996), and this property, as discussed, is due to the function of ADP.

 The rate of plaque appearance can be quantitated in a plaque development assay (Tollefson et al., *supra*). Here, a typical plaque assay is performed, and the plaques observed on subsequent days of the assay are calculated as a percentage of the number of plaques
20 observed at the end of the plaque assay. As shown in Fig. 14, after 4 days of plaque assay on A549 cells, GZ1 and GZ3 had 48% and 34%, respectively, of the final number of plaques, whereas *dl309* had only 1%. It is very unusual in Ad plaque assays in A549 cells for plaques to appear after only 4 days. These large plaques reflect the overexpression of ADP. These GZ1 and GZ3 plaques appear sooner than those of KD1 and KD3 (data not shown), no doubt
25 because GZ1 and GZ3 replicate faster because they have a wild-type E1A region.

 GZ1 and GZ3 lyse cells and spread from cell to cell much more effectively than *dl309*. At 6 days p.i. of A549 cells, approximately as much monolayer destruction was observed with GZ1 and GZ3 at 10^{-3} PFU per cell as was observed with *dl309* at 10^{-1} PFU per cell (Fig. 15, top panel). This result further underscores the conclusion that overexpression of
30 ADP promotes cell lysis and virus spread.

 In theory, GZ1 and GZ3 should be able to replicate not only in tumor cells but also in normal cells. Although they can replicate in normal cells, it is quite possible that GZ1 and GZ3 may be useful as anti-cancer vectors. First, GZ1 and GZ3 could be injected directly into the tumor. Many tumors are self-contained (encapsulated) except for the blood supply. The
35 physical barriers of the tumor could minimize dissemination of the virus to other tissues.

Second, Ads are in general quite benign. Most infections of Ad5 are in infants and result in mild or asymptomatic disease, and are held in check by strong humoral and cellular immunity. Anti-Ad immunity appears to be life-long. GZ1 and GZ3 could be used only in patients who have an intact immune system, and perhaps also with pre-existing anti-Ad immunity. Further, patients could be passively immunized against Ad, using gamma-globulin or even specific purified anti-Ad neutralizing antibodies. Third, considering that Ad5 is a respiratory virus which most efficiently infects lung epithelial cells displaying the specific Ad5 receptor (named CAR) as well as specific integrins (e.g. $\alpha_v\beta_5$), replication-competent vectors derived from Ad5 may not spread efficiently in many non-cancer tissues of the body. In addition, it is believed that versions of GZ1 and GZ3 can be constructed that have the E4 promoter substituted with a tumor-specific, tissue-specific, cell-specific, or synthetic promoter. Such vectors would have the positive features associated with wild-type E1A and ADP, and yet be replication-restricted to tumor tissue and/or to particular cell types.

Example 8

This example illustrates that the combination of KD1, KD3, GZ1, or GZ3 with radiation is more effective in destroying A549 cells, growing in culture or growing as tumors in nude mice, than the vectors alone or radiation alone.

This was shown in a cell spread assay. A549 cells growing in three 48 well culture dishes were mock-infected or infected with different viruses at multiplicities of infection ranging from 10 to 10^{-4} PFU per cell as indicated in Fig. 15. One dish was not radiated. A second dish received 600 centigrays (cGy) of radiation at 24 h p.i., and a third dish received 2000 cGy of radiation at the same time. All dishes were stained with crystal violet at 6 days p.i. With the cells that were not radiated (top panel in Fig. 15), KD1 and KD3 caused monolayer destruction at lower multiplicities of infection than their parental control, *d101/07*. This was also true for GZ1 and GZ3 as compared to their parental control *d1309*. (The paucity of cells in the cells infected with GZ1 or GZ3 at 10^{-4} PFU per cell is an experimental artifact, and is not caused by infection by GZ1 or GZ3). These KD1, KD3, GZ1 and GZ3 results are consistent with earlier results showing that overexpression of ADP leads to increased cell lysis and virus spread.

With the dish that was infected then radiated with 600 cGy there was markedly increased cell killing and virus spread as compared to the non-radiated cells (compare the bottom panel of Fig. 15 with the top panel). For example, with KD1, KD3, GZ1, and GZ3 there was about the same amount of cell destruction in the radiated wells at 10^{-4} PFU per cell as in the non-radiated wells at 10^{-2} PFU per cell. Similar results were seen with the dish that

received 2000 cGy of radiation (data not shown), and also with dishes that received 600 or 2000 cGy of radiation 24 h prior to infection (data not shown).

The amount of cell destruction was quantitated by extracting the crystal violet from the cells with 33% acetic acid, then measuring the absorbance at 490 nm (data not shown).

5 The absorbance with non-radiated mock-infected cells was set at 100% cell viability. With mock-infected cells that received 600 cGy there was a 15% loss in viability (i.e. 15% less crystal violet was extracted). With KD1 at 10^{-3} PFU per cell, the non-radiated cells were 80% viable whereas the cells receiving 600 cGy of radiation were only about 30% viable. Similar differences in viability between radiated and non-radiated cells were seen with KD3, GZ1,
10 and GZ3. These results argue that the combination of radiation plus vector has a synergistic effect on cell lysis and vector spread, rather than an additive effect. If the effect were only additive, then with the KD1 samples at 10^{-3} PFU per cell, the cell viability should have been 65% (15% reduction in viability due to radiation alone, 20% reduction due to KD1 alone). In fact, the cell viability was 30% rather than 65%.

15 As mentioned, approximately as much cell lysis and virus spread were observed with 600 cGy as with 2000 cGy. To determine the optimal dose of radiation to synergize with the vectors, an experiment similar to the one described above was conducted with mock-, *dI01/07*-, KD1-, KD3-, *dI309*, GZ1-, or GZ3-infected A549 cells. The 48 well plates received 0, 150, 300, or 600 cGy of radiation at 24 h p.i. Cells were stained with crystal violet. The
20 results with cells receiving 0 versus 600 cGy of radiation were similar to those in Fig. 15. The crystal violet was extracted from the cells infected with 10^{-3} PFU per cell of the difference viruses. The absorbance of crystal violet was determined, and the percent cell viability was graphed, using the absorbance of the non-radiated mock-infected cells as 100% cell viability. As illustrated in Fig. 16, an approximately linear decrease in cell viability in all
25 wells was obtained with increasing radiation dose, although the slope of the line was more negative with KD1, KD3, GZ1, or GZ3 than with mock, *dI01/07*, or *dI309*. With KD1, KD3, GZ1, and GZ3, there was much more cell lysis and vector spread with their parental control viruses, and there was synergy between the vectors and radiation. For example, with mock-infected cells, 600 cGy reduced cell viability by about 30% (70% of cells were viable). KD1
30 without radiation reduced cell viability by about 23%. The combination of 600 cGy radiation plus KD1 reduced cell viability to about 85%, more than 53% of which is the sum of radiation alone and KD1 alone. When considering the data in Figs. 15 and 16 together, a dose of about 600 cGy is optimal in this type of cell culture experiment.

The combination of KD3 or GZ3 with radiation was also examined in the A549
35 tumor-nude mouse model (see Example 4). A549 cells were injected into the hind flanks of

nude mice, and tumors were allowed to form. When tumors reached approximately 50- μ l, they were injected with buffer or with 5×10^8 PFU of KD3 or GZ3. Eight to ten tumors were injected per test condition. At 1 day p.i., half the mice received 600 cGy of whole body radiation. Tumor size was measured over time, and was plotted as a fold-increase in tumor size versus days p.i. (as described in Example 4). As shown in Fig. 17, the non-radiated buffer-injected tumors grew faster than those injected with KD3 or GZ3. Tumors that received the combination of KD3 and radiation did not grow, and those that received the combination of GZ3 and radiation shrank in size after 14 days. These results indicate that the combination of KD3 plus radiation or GZ3 plus radiation is more effective than either vector alone or radiation alone in reducing the rate of A549 tumor growth in nude mice. It is likely that radiation would increase the effectiveness in treating tumors of KD1 and GZ1, or indeed any other replication-competent or replication-defective Ad vector.

The mechanism by which radiation causes the ADP overexpressing vectors to lyse cells and spread from cell-to-cell more effectively is not understood. Radiation is expected to induce cellular DNA repair mechanisms, and that may allow for more efficient synthesis of Ad DNA. Radiation may enhance the function of ADP. ADP probably functions by interacting with one or more cellular proteins, and radiation may affect this protein(s) such that ADP functions more efficiently.

It is believed that KD1, KD3, GZ1, or GZ3, or any other replication-competent Ad vector, when used in combination with radiation, will be more effective than vector alone or radiation alone in providing clinical benefit to patients with cancer. The vectors should allow more tumor destruction with a given amount of radiation. Stated another way, radiation should cause more tumor destruction with a given amount of vector. These vectors should also allow the radiation oncologist to use less radiation to achieve the same amount of tumor destruction. Less radiation would reduce the side effects of the radiation.

It is also believed that a cocktail of vectors when used in combination with radiation will be more effective than the cocktail alone or radiation alone. The cocktail could consist of ADP producing vectors plus one or more replication defective vectors expressing an anticancer therapeutic protein (see Example 5).

Example 9

This example illustrates a structure-function analysis of adenovirus death protein.

ADP is an 11.6 kDa N-linked O-linked integral membrane glycoprotein that localizes to the inner nuclear membrane (NM) (Scaria et al., Virology 191:743-753). As illustrated in Fig. 18, the Ad2-encoded ADP (SEQ ID NO:6) consists of 101 amino acids; aa 1-40 (SEQ ID NO:17) are luminal, aa 41-59 (SEQ ID NO:18) constitute the transmembrane signal-anchor

(SA) domain, aa 63-70 (SEQ ID NO:19) constitute a basic proline (BP) domain within the nucleoplasmic (NP) domain, which constitutes aa 61-101 (SEQ ID NO:20). To determine which domains in ADP are required to promote cell death, a number of deletion mutants of *rec700* were prepared which lacked various portions of the ADP gene and examined for the ability of ADP to localize to the NM and promote death. The *rec700* virus is an Ad5-Ad-Ad5 recombinant, which has been described elsewhere (Wold et al., *Virology* 148:168-180, 1986).

The structure of ADP in *rec700* and in each deletion mutant is schematically illustrated in Fig. 18. The ADP gene in each deletion mutant has been sequenced using PCR methods to insure that the mutations are correct. The structure and activity of ADP in the deletion mutants was tested by infecting A549 cells followed by immunoblot analysis of the ADP mutant proteins as well as the ability to lyse cells. All deletion mutants expressed a stable ADP protein except *pm734.1* (Δ 1-48, i.e. aa 1-48 are deleted). The *pm734.7* (N₁₄) ADP, which has Asn₁₄ mutated to Ser, is O-glycosylated but not N-glycosylated because Asn₁₄ is the only N-glycosylation site (data not shown). The *dl735* (Δ 4-11) ADP is N-glycosylated but not O-glycosylated because the sites for O-glycosylation are deleted (data not shown). The *pm734.4* (M56) ADP, which has Met₅₆ in the SA domain mutated to Ser, contains exclusively N-linked high-mannose oligosaccharides (data not shown); this occurs because the Met₅₆ mutation precludes exit of ADP from the endoplasmic reticulum (ER). The *dl738* ADP, which lacks aa 46-60 in the signal-anchor domain, forms insoluble aggregates in the cytoplasm; therefore, aa 41-59 do in fact include the signal-anchor domain. The *pm734* (Δ 1-40) ADP, which initiates at Met₄₁ at the N-terminus of the SA domain, comigrated with the lower group of bands generated by proteolytic processing (data not shown). This indicates that the proteolytic cleavage sites occur near Met₄₁. Consistent with this, the proteolytic products were not seen with *dl737* (Δ 29-45) (data not shown). Also, the size of the products decreased in all mutants with deletions within aa 41-101 (*dl715.1*, *dl715*, *dl714*, *dl716*) (data not shown).

The ability of these mutants to promote cell death was monitored by trypan blue exclusion, plaque development, and lactate dehydrogenase release assays (Tollefson et al., *J. Virol.* 70:2296-2306, 1996). The trypan blue results in Fig. 15A indicate that the death-promoting function of ADP was abolished by deletion of aa 1-40 (*pm734*), aa 11-26 (*dl736.1*), aa 18-22 (*dl735.1*), or aa 4-11 (*dl735*). Mutation of the N-glycosylation site at Asn₁₄ (*pm734.7*) reduced the death-promoting activity to about 50% of *rec700* (WT). *dl737* (Δ 29-45) was efficient as *rec700* in promoting cell death; this indicates that the proteolytic processing products must not be required to promote cell death because they are not formed with *dl737*. The SA domain is essential for death because *dl738* (Δ 46-60) and *pm734.4*

(M56) were completely defective (Fig. 19). *dl715.1* was nearly completely defective, indicating that the BP domain is extremely important. Surprisingly, aa 71-94 (*dl714*), 76-89 (*dl715*), and 79-101 (*dl716*) could be deleted without affecting the death-promoting activity of ADP (Fig. 19). On the other hand, deletion of aa 81-88 (*dl717*) nearly completely
 5 abolished the activity of ADP (Fig. 19); this is probably the result of aberrant sorting of ADP (see below). Similar results were obtained when the ability of these ADP mutants to promote cell death was examined with standard plaque development, LDH-release and MTT assays.

The effects of these mutations on the intracellular localization of ADP are extremely interesting. When examined by immunofluorescence (IF) at 33 h p.i. (data not shown), ADP
 10 from *rec700* (WT) localized crisply to the NM; localization to the Golgi was also apparent. With *dl714* (Δ 71-94) and *dl715* (Δ 76-89), ADP localized to all membranes, i.e. the ER, Golgi, plasma membrane, and NM. This was even more apparent at 45 h p.i. (data not shown). Thus, aa 71-94 appear to include a signal that directs ADP specifically to the NM. ADP is very likely sorted from the *trans*-Golgi network (TGN) to the NM, so this putative signal in
 15 ADP probably functions in this sorting pathway. ADP from *dl717* (Δ 81-88) is intriguing: it localized to the NM and Golgi, but in many cells "dots" and circular structures were observed. Again, this was more apparent at 45 h p.i. when these structures were the prominent feature. *dl717*-infected cells have not begun to die at 45 h p.i., so these structures are not cellular remnants. The intriguing possibility is that these structures are membrane vesicles that have
 20 pinched off from the TGN but are defective in targeting to and/or fusing with the NM.

With *dl738* (Δ 46-60 in the SA domain), ADP aggregated in the cytoplasm. This again indicates that aa 46-60 include the SA sequence. With *pm734.4* (M56), ADP localized primarily to the NM. As discussed above, the *pm734.4* ADP has exclusively high-mannose N-linked oligosaccharides, indicating that it never leaves the ER. Perhaps the putative NM-
 25 localization signal in the C-terminal region of the *pm734.4* ADP targets ADP to the NM by lateral diffusion from the ER (which is continuous with the outer and inner NM).

With *dl737* (Δ 29-45), ADP localized to the NM. ADP from *pm734* (Δ 1-40), *pm734.7* (N14) (N-linked glycosylation cannot occur), and *dl735* (Δ 4-11; the O-glycosylation sites are deleted) localized much more prominently to the Golgi than the NM. ADP from *dl735.1*
 30 (Δ 18-22) and *dl736.1* (Δ 11-26) also localized much more strongly to the Golgi than the NM. Thus, residues 1-26 and/or glycosylation appear to be required for efficient transport of ADP from the Golgi/TGN to the NM.

In summary, aa 41-59 include the SA domain, Met₅₆ in the SA domain is required for exit from the ER, aa 1-26 are required for efficient exit from the Golgi, and aa 76-94 are
 35 required to target ADP specifically to the NM. With respect to promoting cell death, the

essential regions are aa 1-26, the SA domain (ADP does not enter membranes), Met₅₆ in the SA domain, and the BP domain (aa 63-70). It is not clear whether the defective death-promoting phenotype of *pm734* (Δ 1-40), *dl735* (Δ 4-11), *dl735.1* (Δ 18-22), *dl736.1* (Δ 11-26), and *pm734.7* (N14) is due to lack of sequences (or oligosaccharides) that promote death or to much slower exit of ADP from the Golgi to the NM. *dl714* (Δ 71-94) and *dl715* (Δ 76-89) express a wild-type phenotype for promoting death even though they are defective in localizing specifically to the NM; this is probably because sufficient ADP still enters the NM to promote death. Even though the deletion in *dl717* (Δ 81-88) lies within the deletions in *dl715* (Δ 76-89) and *dl714* (Δ 71-94), the *dl717* ADP is only about 15% as efficient as *rec700* (WT), *dl715* and *dl714* in promoting death. This may be because the *dl717* ADP tends to remain in vesicles rather than localizing to the NM. Altogether, these data indicate that ADP must localize to the NM in order to promote cell death.

Example 10

This example further characterizes the tissue specific Ad vectors described in Example 6. As discussed therein, the Ad E4 promoter is deleted and replaced with the promoter for surfactant protein B (SPB) in these vectors (Figure 24).

Materials and Methods

Cells, vectors and methods described in Example 6 were also used in this Example. In addition to the human cancer cell lines A549 (human lung carcinoma), Hep 3B (human hepatocellular carcinoma), and H441 (papillary lung adenocarcinoma) used in Example 6, HEK 293 cells (obtained from Microbix (Toronto, ON)) and VK10-9 cells were used. VK10-9 cells are 293 cells that in addition to E1 contain and express E4 and pIX. These cells will be referred to as 293-E4 cells.

Experiments employing phase contrast microscopy of Hep 3B and H441 cells were performed as follows. Monolayers of Hep 3B or H441 cells were grown in 60 mm dishes with 5 ml of DMEM (10% FBS), and were mock-infected or infected with KD1 or KD1-SPB at a multiplicity of infection of 10 plaque forming units (PFU) per cell. Phase contrast photographs of monolayers were taken at 4 and 7 days postinfection (p.i.).

Experiments employing western blots of H441 or Hep 3B cells were performed as follows. H441 or Hep 3B cells (in 60 mm dishes) were infected with 10 PFU/cell of KD1 or KD1-SPB. At 24 h p.i., the cells were washed three times with PBS and harvested by scraping. The cells were lysed by RIPA buffer. The protein concentration was measured by the BIO-RAD DC Protein Assay Kit (BIO-RAD Laboratories, Hercules, CA) and 10 μ g of each sample were electrophoresed on 15% sodium dodecylsulfate polyacrylamide gels (SDS-PAGE). The gels were electroblotted onto PVDF membranes (Immobilon, Millipore,

Bedford, MA). The membranes were blocked in TBST (50 mM Tris-Cl, pH 7.6, 150 mM NaCl, 0.2% Tween 20) containing 10% dry milk (Carnation) overnight at 4°C. After blocking, the membranes were incubated with a rabbit polyclonal antiserum against E4ORF3 (gift of Gary Ketner) or ADP (Tollefson et al., *J. Virol.* 66:3633-3642, 1992), or with M73, a
5 monoclonal antibody against E1A (Harlow et al., *J. Virol.* 55:533-546, 1985). The secondary antibodies were goat anti-rabbit IgG-HRP or goat anti-mouse IgG-HRP. The blots were developed using the ECL protocol (Amersham Pharmacia, Arlington Heights, IL).

Experiments employing a lactate dehydrogenase release assay for cell lysis (Tollefson et al., *J. Virol.* 70:2296-2306) were performed as follows. H441 cells (7.7×10^5 cells per 35
10 mm dish) and Hep 3B cells (9.0×10^5 cells per 35 mm dish) were infected at 20 PFU/cell in one ml serum-free DMEM. After an adsorption period of 1 h, 3 ml of DMEM (10% FBS) were added (final FBS concentration of 7.5%). Cells were incubated at 37°C with 6% CO₂. At daily intervals, supernatants were collected, microfuged to remove floating cells, and cell-free supernatants were frozen at -70°C until assayed. Total lysis samples were prepared by
15 addition of 10X lysis buffer included in the Cyto Tox 96 kit (Promega, Madison, WI). After all samples were collected, 20 µl samples were assayed in triplicate using the LDH assay kit Cyto Tox 96 and read on an EL340 Microplate reader (BioTec™ Instruments, Inc.) at 490 nm.

Experiments employing immunofluorescence evaluation of H441 and Hep 3B cells
20 were performed as follows. H441 and Hep 3B cells were plated on Corning #1 coverslips in 35 mm dishes. H441 (1.5×10^6 cells/35 mm dish) and Hep 3B (9.0×10^5 cells/35 mm dish) were infected with 20 PFU/cell of the indicated viruses in 1 ml serum-free DMEM. After 1 h, 1 ml of DMEM/20% FBS was added (final concentration of 10% FBS). At the indicated times (48 h or 6 d p.i.), cells were fixed for 10 min in 3.7% paraformaldehyde in PBS, then
25 permeabilized for 6 min in methanol (-20°C) and rehydrated in PBS. Coverslips were stained with rabbit antipeptide antiserum against the Ad E2A-coded DNA binding protein (DBP) (1:400 dilution; gift of Maurice Green) and mouse monoclonal antibody against fiber (1:400 dilution; gift of Jeff Engler) or were stained with rabbit antiserum to E4ORF3 (1:250 dilution; gift of Gary Ketner). Secondary antibodies (Cappel/ICN) were used at 1:50 dilution. All
30 antibodies were diluted in PBS containing 1% BSA and 0.1% sodium azide. Photographs were taken on a Nikon epifluorescence microscope using a 100X Planapo lens and Tmax 400 film (Kodak). The film was developed in Diafine developer.

Analysis of viral DNA replication by Southern hybridization was performed as follows. H441 and Hep 3B cells were grown in 60 mm dishes in DMEM supplemented with
35 10% FBS. Cells were infected at 70% confluence with 10 PFU/cell of KD1 or KD1-SPB.

Dishes were incubated in humidified 5% CO₂ atmosphere at 37°C. Total genomic DNAs were isolated at 5, 24, 48, 72, and 96 h p.i. Equal amounts of total genomic DNAs were digested with HindIII and resolved on a 1% agarose gel prior to transfer onto membranes. A random primer ³²P-labeled pBHG10 plasmid probe (Bett et al., *Proc. Natl. Acad. Sci. USA* 91:8802-8806, 1994) was used for hybridization, and the blots were autoradiographed. DNA fragments were quantitated on a Molecular Dynamics PhosphorImager.

Virus yields were determined as follows. Hep 3B cells or H441 cells grown as monolayers in 35 mm dishes were infected with 10 PFU/cell of KD1 or KD1-SPB. At days 0 to 4 (for H441) or days 0 to 9 (for Hep 3B) p.i., cells and culture medium were frozen at -70°C. Samples were frozen and thawed three times to release the virus from the cells, and total virus yields were determined by plaque assay on A549 monolayers.

The effect of KD1-SPB and KD1 on H441 and Hep 3B tumors was examined in a nude mouse model (Doronin et al., *J. Virol.* 74:6147-6155, 2000). Tumor cells (10⁷ cells in 200 µl of DMEM, 50% Matrigel [Becton Dickinson Labware, Bedford, MA] for H441 cells, or 10⁷ cells in 200 µl of DMEM plus 10% Matrigel for Hep 3B cells) were injected into flanks of 5-6 weeks old athymic nude mice and allowed to grow for three weeks to about 100 µl (H441) or 150 µl (Hep 3B) volumes. Pre-established tumors (n = 10) were injected with 50 µl of DMEM or 5 x 10⁷ PFU of indicated viruses in DMEM. Injections of the viruses were repeated twice weekly for 3 weeks to the total dose of 3.0 x 10⁸ PFU per tumor. Tumor size measurements were taken twice per week for H441 cells, or weekly for Hep 3B cells using a Sylvac digital caliper. Tumor volumes were calculated in according to the formula: length x width² / 2. Data are represented as means of increase in tumor size relative to the tumor size at the initial injection.

Results

The properties of KD1-SPB in various cell types were compared to those of its "parent", KD1. Figure 25 shows the plaque development properties of these vectors on 293-E4, 293, and A549 cells. The data are plotted as the number of plaques seen on any day of the plaque assay as a percentage of the number of plaques seen at the end of the assay (i.e. when new plaques cease to appear) (Tollefson et al., *J. Virol.* 70:2296-2306, 1966). This assay is an indicator of the size of the plaques. KD1 formed plaques equally well on 293-E4 and 293 cells (Figure 25A). With KD1-SPB, plaques were observed about 3-4 days sooner on 293-E4 compared to 293 cells (Fig. 2A). On A549 cells, KD1 formed plaques 4-6 days sooner than KD1-SPB (Figure 25B).

The properties of KD1-SPB versus KD1 were characterized in detail in H441 cells, a human papillary lung adenocarcinoma cell line known to express the TTF1 transcription

factor and in which the SPB promoter is active (Yan et al., *J. Biol. Chem.* 270:24852-24857, 1995). Hep 3B cells, a human hepatocellular carcinoma in which the SPB promoter should not be active, were used as a negative control. H441 and Hep 3B monolayers were infected with 10 PFU/cell of KD1 or KD1-SPB and photographed at 4 and 7 days p.i. Mock-infected
5 Hep 3B cells formed a relatively homogeneous monolayer, but H441 cells tended to form structures that resemble syncytia (Figure 26A, B). As expected, KD1 produced cytopathic effect (CPE) on both cell lines at 4 and 7 days p.i. (Figure 26A, B). Also as expected, KD1-SPB caused CPE on H441 cells but not on Hep 3B cells. Since CPE in Ad-infected cells is usually an indicator of virus growth, these results suggest that KD1-SPB grows in H441 but
10 not in Hep 3B cells.

To examine viral DNA replication, H441 and Hep 3B cells were infected with 10 PFU/cell of KD1 or KD1-SPB, then the accumulation of viral DNA was determined by DNA blot. With H441 cells, KD1 and KD1-SPB DNAs were readily detected at similar levels at 48-96 h p.i. (Figure 27A). With Hep 3B cells, KD1 DNA levels were similar to those in
15 H441 cells, but KD1-SPB DNA was barely detectable. This was confirmed by PhosphorImager analysis of the DNA bands (Figure 27B).

Growth of KD1-SPB and KD1 in H441 and Hep 3B cells was determined by a single step growth assay. Cells were infected with 10 PFU/cell of vector, then total vector yield was determined by plaque assay. Total yield of both vectors was similar in H441 cells, reaching a
20 plateau after 2 days (Fig. 28A). KD1 yield plateaued in Hep 3B cells after 2-4 days p.i. (Figure 28B). However, KD1-SPB levels were about 5 logs lower in Hep 3B cells after 2-4 days, and even by 9 days they had not achieved the levels of KD1. We conclude that KD1-SPB grows with significant specificity on H441 versus Hep 3B cells. Further, KD1-SPB grows as well as KD1 on H441 cells, indicating that the E4 promoter deletion by itself does
25 not significantly compromise the vector, and that the E4 promoter can be replaced by a tissue-specific promoter in a replication-competent vector.

To obtain further details on the replication of KD1-SPB vs KD1 in H441 and Hep 3B cells, the expression of representative Ad proteins by KD1-SPB and KD1 was examined. H441 or Hep 3B cells were mock-infected or infected with 10 PFU/ml of KD1 or KD1-SPB,
30 then at 24 h p.i. the proteins were extracted and the E1A, E4ORF3, and ADP proteins were examined by immunoblot. E4ORF3 is one of the six proteins coded by the E4 transcription unit (Leppard, *J. Gen. Virol.* 78:2131-2138, 1997). As anticipated, KD1-SPB expressed E4ORF3 well in H441 cells, but only at trace levels in Hep 3B cells (Figure 29). KD1-SPB expressed the E1A proteins in Hep 3B cells. Synthesis of E1A proteins by KD1-SPB in Hep
35 3B cells is expected because E1A expression does not require E4 proteins; it also indicates

that the block to infection with KD1-SPB is downstream of E1A. KD1 expressed E1A in both cell lines, but the amount was less than obtained with KD1-SPB in Hep 3B cells (Figure 29). The increased E1A levels seen with KD1-SPB may reflect its poor ability to enter the late phase of infection (see Discussion). KD1-SPB expressed ADP as well as KD1 in H441
5 cells, but it did not make detectable ADP in Hep 3B cells. ADP is primarily a late protein, so this result is consistent with the relative lack of E4 protein expression, DNA replication, and growth of KD1-SPB in Hep 3B cells.

To gain insights into replication events that occur in individual cells, expression of E4ORF3, the E2A-DBP, and the fiber late protein was examined by immunofluorescence.
10 H441 or Hep 3B cells were infected with 20 PFU/cell. At 48 h or 6 days p.i., cells were fixed and immunostained. E4ORF3 was detected in the nuclei of H441 cells at 48 h p.i. with KD1, KD1-SPB, or dl309 (Figure 30A). (dl309 is an Ad5 mutant that has wild-type E1A, expresses Ad5 levels of ADP, and lacks the E3-RID and E3-14.7K genes). E4ORF3 could not be detected in the vast majority of Hep 3B cells infected with KD1-SPB (Figure 30A), even at 6
15 days p.i. (Figure 30B). Thus, KD1-SPB expresses E4ORF3 well in H441 but not in Hep 3B cells.

Figure 31A shows double label immunofluorescence of DBP and fiber in the same Hep 3B cells at 48 h p.i. with KD1 or KD1-SPB. With KD1, there was a strong speckled staining pattern in the nucleus that is typical for DBP at 48 h p.i. (Figure 31A, top left panel).
20 There was strong staining of fiber throughout these same cells (Figure 31A, top right panel). Staining of the cytoplasm and nucleus is expected because fiber is synthesized in the cytoplasm and then transported to the nucleus where virions assemble. With KD1-SPB at 48 h p.i., about 25% of the cells showed the speckled staining for DBP, and only one cell (7% of total) with the advanced speckled pattern was also stained for fiber (Figure 31A, bottom two
25 panels). Even at 6 days p.i., only about 30% of cells showed staining for DBP, and about 20% for fiber (Figure 31B). Thus, markedly fewer Hep 3B cells infected with KD1-SPB expressed DBP and especially fiber as compared to KD1. These results indicate that KD1-SPB replicates as well as KD1 in H441 cells, no doubt because the SPB promoter is active in H441 cells (Yan et al., *J. Biol. Chem.* 270:24852-24857, 1995). KD1-SPB barely replicates
30 in Hep 3B cells, presumably because the SPB promoter is minimally active in these cells.

At the culmination of replication, Ad-infected cells are lysed and the virus spreads to other cells; this process is mediated in large part by ADP (Tollefson et al., *Virology* 220:152-162, 1996; Tollefson et al., *J. Virol.* 70:2296-2306, 1996). To examine vector-induced cell lysis, H441 and Hep 3B cells were mock-infected or infected with 20 PFU/cell of KD1, KD1-
35 SPB, or dl309, and cell lysis was determined by release of lactate dehydrogenase (Tollefson et

al., *J. Virol.* 70:2296-2306, 1996). All vectors lysed H441 cells beginning at 2-3 days p.i. (Figure 32A). KD1 and dl309 also lysed Hep 3B cells in the same time period; however, KD1-SPB caused only minimal cell lysis (Figure 9B). Thus, these data, along with the cell spread data in Example 6 and Figure 13, demonstrate that KD1-SPB lyses cells and spreads efficiently from cell-to-cell in H441 but not Hep 3B cells.

An experiment was conducted to determine whether KD1-SPB or KD1 would suppress H441 tumors in nude mice. H441 cells were injected into each hind flank. When tumors had grown to about 100 μ l (H441) or 150 μ l (Hep 3B), they were injected twice weekly for 3 weeks with DMEM (mock) or 5×10^7 PFU of test virus in 50 μ l of DMEM (3.0×10^8 total PFU). Ten tumors (5 mice) were used for each virus. Growth of H441 tumors was suppressed similarly by KD1-SPB and KD1 (Figure 33A). KD1 suppressed growth of Hep 3B tumors, whereas KD1-SPB caused only minimal suppression (Figure 33B). These results show that KD1-SPB is as effective as KD1 in suppressing tumors when the SPB promoter is active. Further, the cell type specificity observed with KD1-SPB in vitro is maintained in vivo.

Discussion

Tumor specificity is one of the biggest challenges facing cancer gene therapy, i.e. having the therapeutic gene be expressed specifically in cancer cells. Specificity is very important for RC viruses. Two main strategies have been described that in theory confer specificity: transductional targeting and transcriptional targeting. Directing specificity of vectors toward specific cell surface receptors on the target cells has been attempted through various methods. Although this approach is theoretically attractive it might encounter multiple obstacles such as the lack of incorporation of the engineered protein into the virion (Scaria et al., *Virology* 191:743-753, 1992) or lack of infectivity through the targeted receptor (Cosset et al., *J. Virol.* 69:6314-6322, 1995). Transcriptional targeting utilizes tumor and tissue specific promoters. In replication-defective vectors these regulatory sequences confine the expression of cytotoxic genes to specific tissues. In replication-competent vectors, as an added layer of regulation, vector replication per se can be placed under the control of tumor or tissue specific promoter/enhancer sequences. In replication-competent Ad, insertion of the tissue or tumor specific promoter/enhancer into the E1A promoter/enhancer region has been used exclusively (Hallenbeck et al., *Hum. Gene Ther.* 10:1721-1733, 1999; Rodriguez et al., *Cancer Res.* 57:2559-2563, 1997; Yu et al., *Cancer Res.* 59, 4200-4203, 1999; Yu et al., *Cancer Res.* 59:1498-1504, 1999). The rationale behind these vectors is that expression of E1A and therefore the whole Ad transcription program will depend on these tissue or tumor specific promoters. However, as a generic approach, there may be difficulties. The E1A

enhancer/promoter is very complex. The enhancer controls not only the E1A promoter but also distant promoters such as the E4 promoter (Shenk, T. pp. 2111-2148 *In* B.N. Fields, D.M. Knipe, and P.M. Howley (eds.), *Fields Virology*, Lippincott-Raven, Philadelphia, 1996). In addition, it has been shown that the E1A enhancer in the inverted terminal repeat region changes tissue specificity of cellular promoters (Shi et al., *Hum. Gene Ther.* 8:403-410, 1997). Also, the E1A enhancer/promoter is partially embedded within the signals required to package the Ad genome into virions, and it may be problematic to remove all the E1A enhancer elements without impairing virus production. Accordingly, we chose to replace the E4 promoter with a tissue specific promoter. E4 genes are essential for Ad replication, and therefore we expected that the replication of the recombinant virus would be dependent on the tissue specific regulatory elements.

To construct KD1-SPB, the ca. 300 bp of the E4 promoter was deleted and the B-500 version (ca. 500 bp) of SPB promoter was inserted (Yan et al., *supra*) (Figure 24 C, D). We selected the SPB promoter because of its strict tissue specificity: it is exclusively active in type II alveolar cells and bronchial epithelial cells of the lung (Bohinski et al., 1994, *Mol. Cell. Biol.* 14:5671-5681, 1994). Since the parental virus KD1 contains and expresses two E1A mutations that restrict virus replication to tumor cells (Doronin et al., *supra*), we anticipated that the virus would selectively replicate in cells derived from lung tumors. Thus, H441 cells, a papillary lung carcinoma cell line, were used to characterize the replication, gene expression, and functional profile of KD1-SPB.

KD1-SPB formed plaques 3-4 days sooner on 293-E4 cells that express E4 proteins than on 293 cells, whereas KD1 formed plaques with the same kinetics on both cell lines. These data show that the E4 promoter is active in 293 cells, and that the SPB promoter displays very low activity in 293 cells. It is not clear why KD1-SPB forms plaques on 293 cells; these cells are derived from human embryonic kidney and at least one of the transcription factors regulating the SPB promoter (Bohinski et al., *supra*), hepatocyte nuclear factor 3, is expressed in embryonic kidney. It is also possible that TTF1, the master regulatory factor of SPB expression, is minimally active in 293 cells.

KD1 grew to equally high titers in H441 and Hep 3B cells (Figure 28A, B). In contrast, KD1-SPB replicated as efficiently as KD1 in H441 cells, in which the SPB promoter is active (Yan et al., *supra*) (Figure 28A), but replicated poorly in Hep 3B cells, most likely because the SPB promoter is inactive (Figure 28B). This selectivity has been confirmed by measuring viral DNA production in the two cell lines. KD1-SPB DNA replication was similar both kinetically and quantitatively to KD1 DNA replication in H441, however in Hep

3B cells, KD1-SPB DNA was almost undetectable (Figure 27A, B). The cytopathic effect, a surrogate marker of Ad replication, showed a similar specificity (Figure 26).

To further confirm our predictions on the molecular basis of the observed issue specificity we monitored viral protein expression. When cells were infected with KD1-SPB all the viral proteins early or late, except for E1A, were expressed in a tissue-specific fashion (high expression in H441, low to undetectable expression in Hep 3B) (Figures 29-31). We found a good correlation between the levels of E4 promoter activity (E4ORF3 expression) and the expression of E2A-DBP, ADP, and fiber proteins. Thus, the SPB promoter retains its tissue specificity in the Ad genome and it seems to be the limiting factor of Ad gene expression in the cell lines tested. As expected, expression of E1A is not tissue-specific. Thus, the regulatory step of tissue-specific Ad DNA replication is downstream of E1A. In Hep 3B cells, KD1-SPB expressed E1A at a higher level than did KD1 (Figure 29), strongly suggesting that KD1-SPB replication in most of the Hep3B cells remains at the early stage.

The cytolytic effect of KD1-SPB also showed a tissue-specific profile (Figure 32; Figure 13 of Example 6), i.e., preferential lysis of H441 cells over Hep 3B cells, a pattern similar to the specificity observed at the level of DNA replication (Figure 27) and viral protein synthesis (Figures 29-31). This cell type specificity was also observed when these cells were growing as tumors in nude mice. Growth of H441 tumors was suppressed by KD1-SPB and KD1 at similar efficacy (Figure 33A). In contrast, KD1-SPB unlike KD1 had only minimal effect on the growth of Hep 3B tumors (Figure 33B).

In summary, substitution of the E4 promoter with a tissue specific promoter allows highly tissue specific replication of Ad vectors and in the target tissue it is as efficient as the replication of the parental virus. KD1-SPB lacks all E3 genes except ADP. E3 gp19K, RID and 14.7K have been shown to protect Ad-infected cells from attack by cytotoxic lymphocytes and apoptosis-inducing cytokines such as tumor necrosis factor and Fas ligand (Wold et al., pp. 200-232 *In A.J. Cann (ed.), DNA Virus Replication: Frontiers in Molecular Biology*, Oxford University Press, Oxford, 2000; Wold et al., *Curr. Opin. Immunol.* 11:380-386, 1999).

The therapeutic index (virus produced in H441 cells compared to Hep 3B cells) of KD1-SPB is 10^4 - 10^5 for the first 4-5 days (Figure 28). These data compare to data reported by Calydon (10^4 - 10^5) for their prostate specific viruses (Rodriguez et al., *supra*; Yu et al., *Cancer Res.* 59, 4200-4203, 1999; Yu et al., *Cancer Res.* 59:1498-1504, 1999). We suggest that KD1-SPB has some added advantage over vectors reported by other laboratories because it encodes a mutant form of E1A that restricts replication to cancer cells (Doronin et al., *supra*).

Although the lung ranks as the second highest cancer site for both men and women in the U.S. Reis et al., *Cancer Res.* 88:2398-2424, 2000), lung cancer has not been a major target for cancer vector gene therapy since intratumoral injection of virus is generally not feasible in the lungs. However, there has been a recent report of intratumor injection of a replication-
5 defective Ad vector into a lung tumor, and such an approach could be attempted with KD1-SPB. It may also be feasible to administer KD1-SPB systemically in the lung.

In view of the above, it will be seen that the several advantages of the invention are achieved and other advantageous results attained.

As various changes could be made in the above methods and compositions
10 without departing from the scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

All references cited in this specification, including patents and patent
applications, are hereby incorporated by reference. The discussion of references herein is
15 intended merely to summarize the assertions made by their authors and no admission is made that any reference constitutes prior art. Applicants reserve the right to challenge the accuracy and pertinence of the cited references.

What is Claimed Is:

1. A recombinant vector which is replication-competent in a neoplastic cell and which overexpresses an adenovirus death protein.
2. The recombinant vector of claim 1 wherein the adenovirus death protein comprises amino acids 1-26, 41-59, and 63-70 of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, or SEQ ID NO:8 or a conservatively substituted variant thereof or wherein the adenovirus death protein comprises SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, or SEQ ID NO:8.
3. The recombinant vector of claim 2 which comprises a recombinant virus.
4. The recombinant vector of claim 3, wherein the recombinant virus is an adenovirus lacking expression of at least one E3 protein selected from the group consisting of: gp19K; RID α ; RID β and 14.7K.
5. The recombinant vector of claim 4 which comprises SEQ ID NO:3 or SEQ ID NO:4.
6. The recombinant vector of claim 3 which is replication-restricted to neoplastic cells.
7. The recombinant vector of claim 6 which comprises SEQ ID NO:1 or SEQ ID NO:2.
8. The recombinant vector of claim 3, wherein the recombinant adenovirus comprises a tissue specific promoter, a tumor specific promoter, or an inducible promoter substituted for the E4 promoter.
9. The recombinant vector of claim 8, wherein the tissue-specific promoter is a surfactant protein B promoter.
10. The recombinant vector of claim 6 which comprises SEQ ID NO:14, SEQ ID NO:15 or SEQ ID NO:16.
11. The recombinant vector of claim 1, wherein the vector further comprises a gene encoding an anti-cancer product.
12. The recombinant vector of claim 11, wherein the gene encoding an anti-cancer product is in the E3 region of the vector.
13. A method for promoting death of a neoplastic cell comprising contacting the neoplastic cell with at least one vector which is replication competent in the neoplastic cell and which overexpresses an adenovirus death protein.
14. The method of claim 13 wherein the adenovirus death protein comprises amino acids 1-26, 41-59, and 63-70 of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, or SEQ

ID NO:8 or a conservatively substituted variant thereof or wherein the adenovirus death protein comprises SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, or SEQ ID NO:8.

15. The method of claim 14, wherein the vector comprises a recombinant adenovirus lacking expression of at least one E3 protein selected from the group consisting of: gp19K; RID α ; RID β and 14.7K.

16. The method of claim 15, wherein the neoplastic cell comprises a tumor in a patient and the contacting step comprises administering the recombinant adenovirus to the tumor.

17. The method of claim 16, further comprising the step of passively immunizing the patient against the recombinant adenovirus.

18. The method of claim 17, wherein the recombinant adenovirus comprises SEQ ID NO:3 or SEQ ID NO:4.

19. The method of claim 15, wherein the vector is replication-restricted to neoplastic cells.

20. The method of claim 19, wherein the vector is a recombinant adenovirus comprising SEQ ID NO:1 or SEQ ID NO:2.

21. The method of claim 15, wherein the recombinant adenovirus comprises a tissue specific promoter or an inducible promoter substituted for the E4 promoter.

22. The method of claim 21, wherein the tissue specific promoter is a surfactant protein B promoter.

23. The method of claim 22, wherein the recombinant adenovirus comprises SEQ ID NO:14, SEQ ID NO:15 or SEQ ID NO:16.

24. The method of claim 16, further comprising treating the tumor with radiation.

25. The method of claim 24, comprising administering more than one recombinant adenovirus to the tumor and treating the tumor with radiation.

26. The method of claim 16, further comprising treating the tumor with chemotherapy.

27. The method of claim 26, comprising administering more than one recombinant adenovirus to the tumor and treating the tumor with chemotherapy.

28. The method of claim 16, further comprising administering to the tumor one or more replication-defective adenovirus which expresses an anti-cancer gene product, wherein the recombinant adenovirus complements spread of the replication-defective adenovirus in the tumor.

29. A composition comprising:

a first recombinant virus which is replication competent in a neoplastic cell and overexpresses an adenovirus death protein; and

a second recombinant virus which is replication defective and which expresses an anti-cancer gene product,

wherein the first recombinant virus complements replication of the second recombinant virus.

30. The composition of claim 29 wherein the first recombinant virus comprises a recombinant adenovirus lacking expression of at least one E3 protein selected from the group consisting of: gp19K; RID α ; RID β and 14.7K.

31. The composition of claim 30 wherein the recombinant adenovirus comprises a nucleotide sequence selected from the group consisting of: SEQ ID NO:1; SEQ ID NO:2; SEQ ID NO:14; SEQ ID NO:15; SEQ ID NO:16; SEQ ID NO:3; or SEQ ID NO:4.

32. A composition comprising

a first recombinant virus which is replication-defective in a neoplastic cell and which overexpresses an adenovirus death protein, and

a second recombinant virus which is replication-competent in a neoplastic cell.

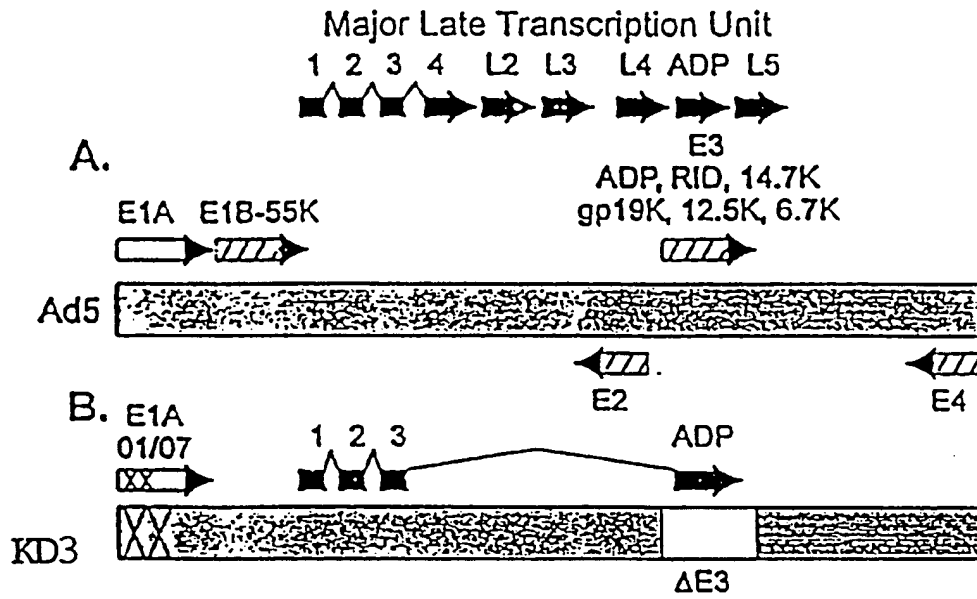


FIGURE 1

ADP Is Expressed Earlier in Infection
By KD1, KD3, GZ1, and GZ3

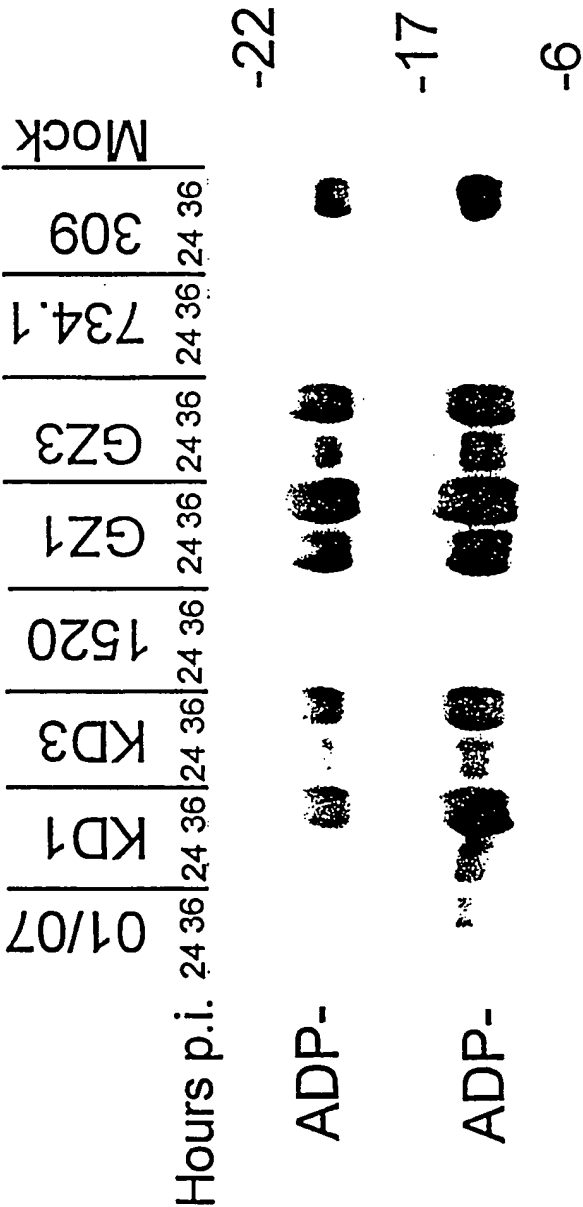


FIGURE 2

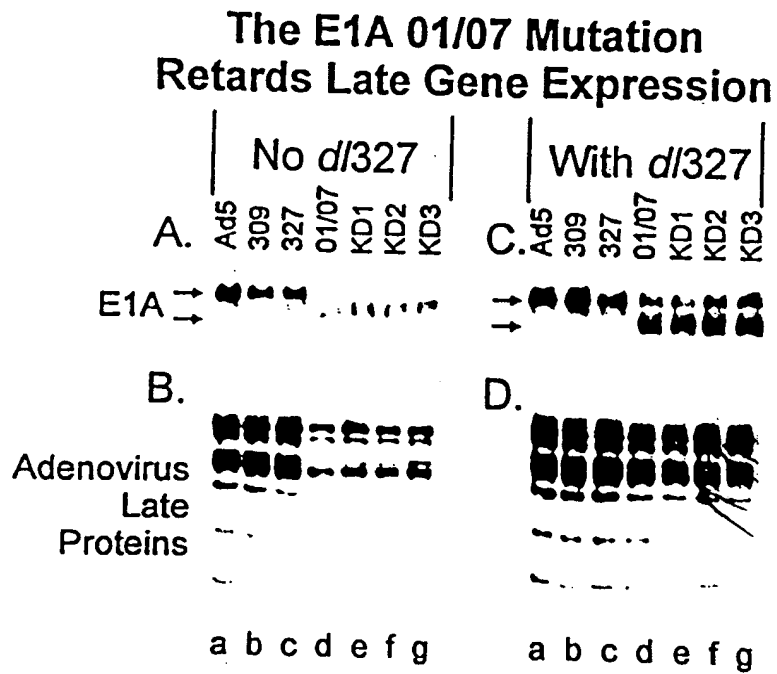


FIGURE 3

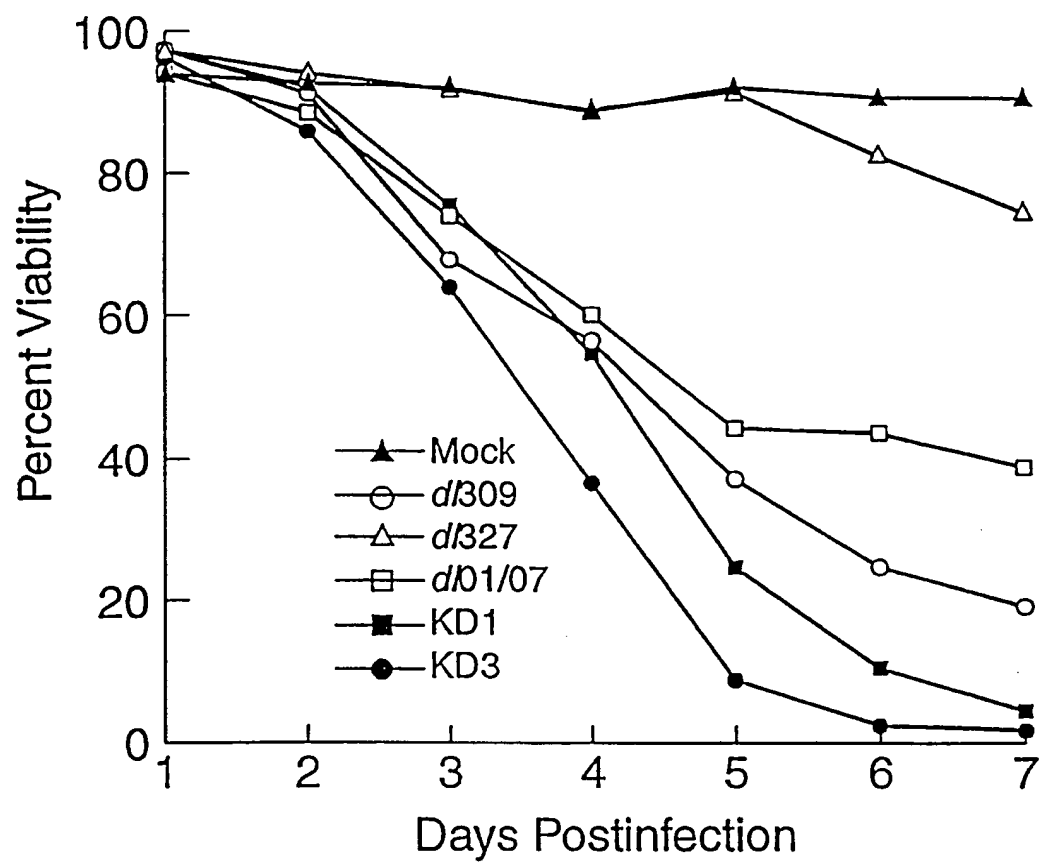


FIGURE 4

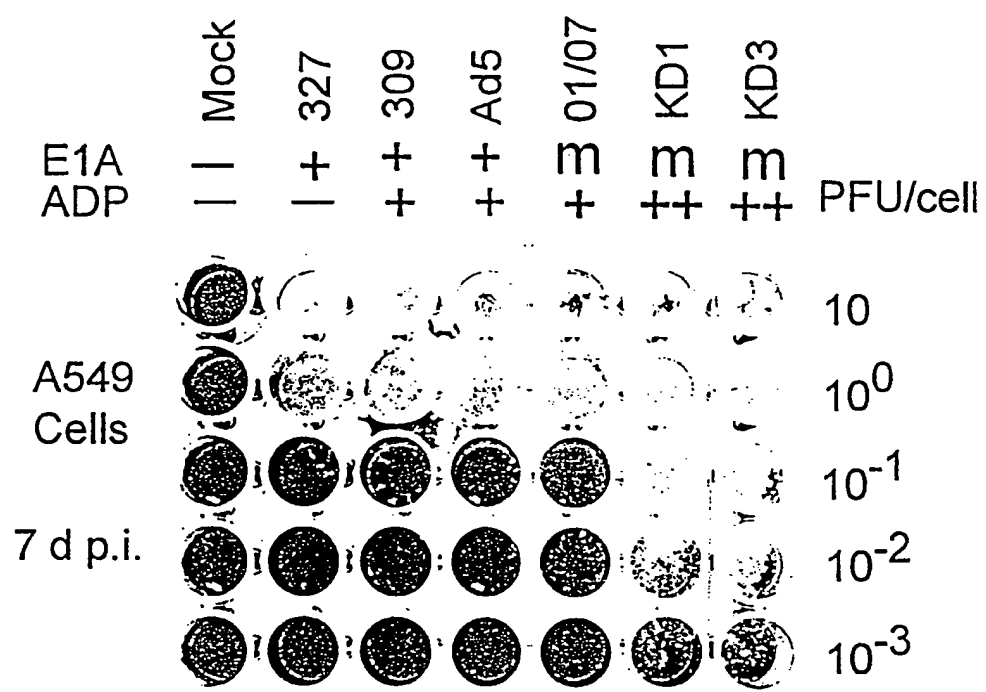


FIGURE 5

5/66

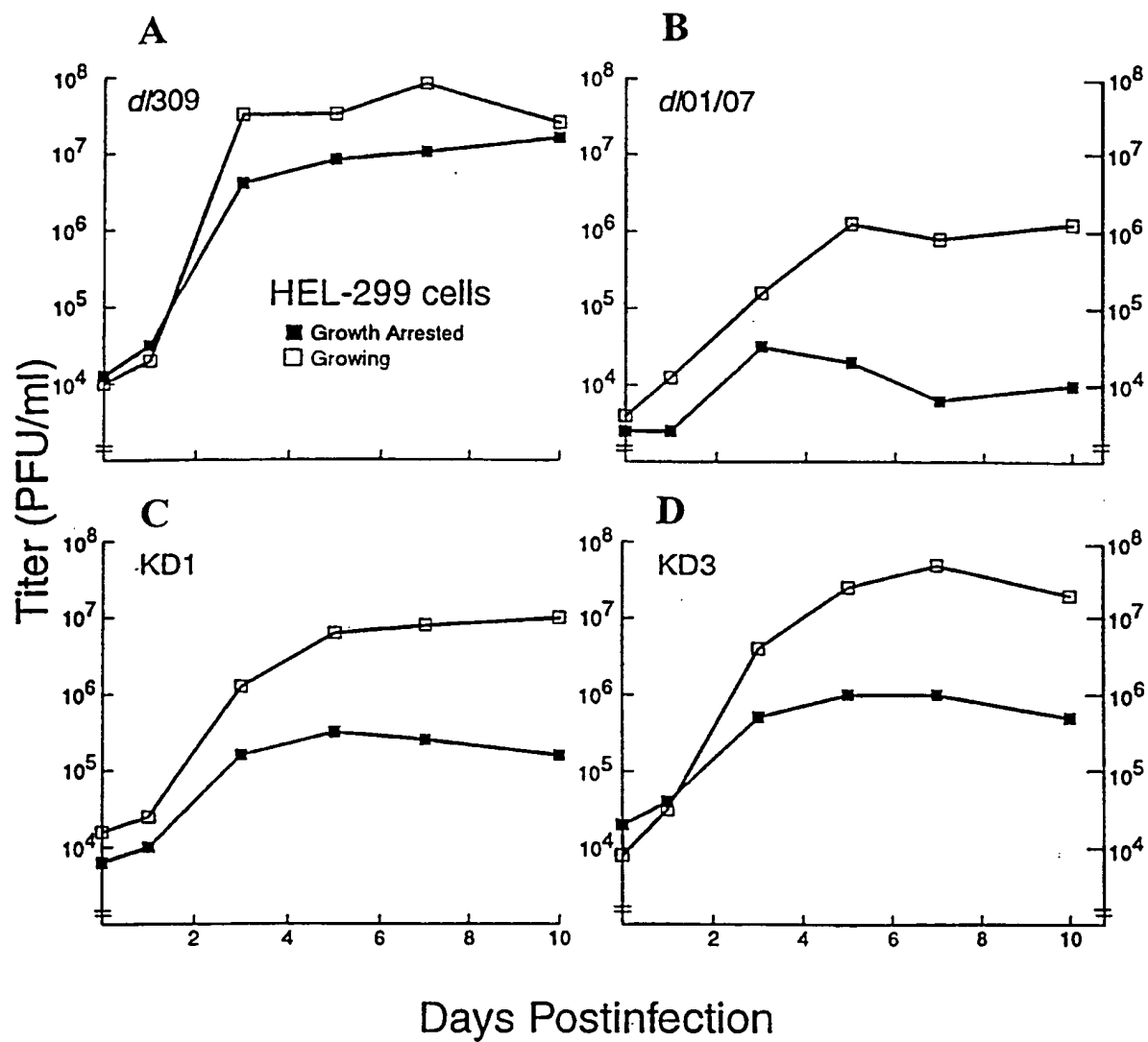


FIGURE 6

6/66

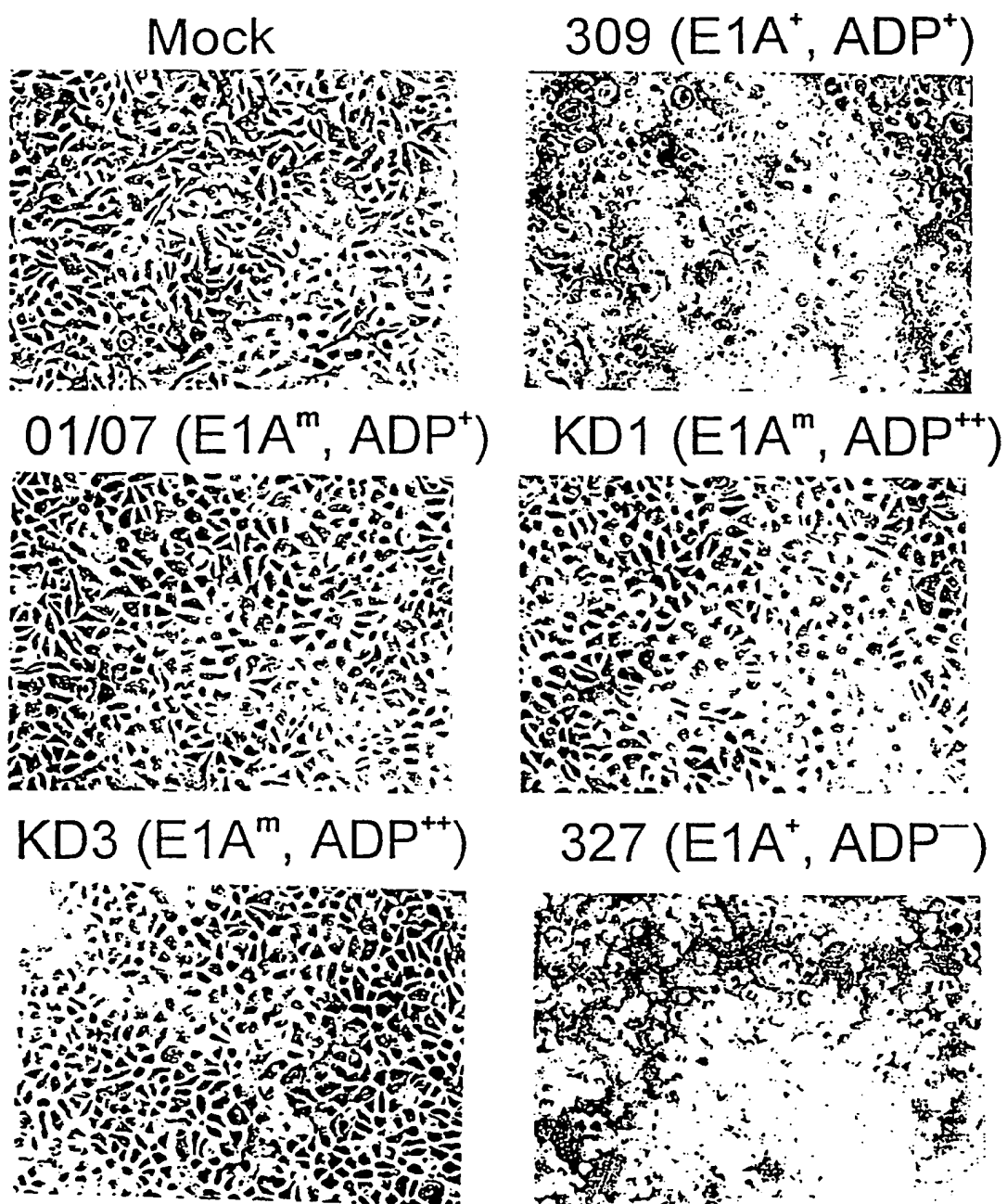


FIGURE 7

7/66

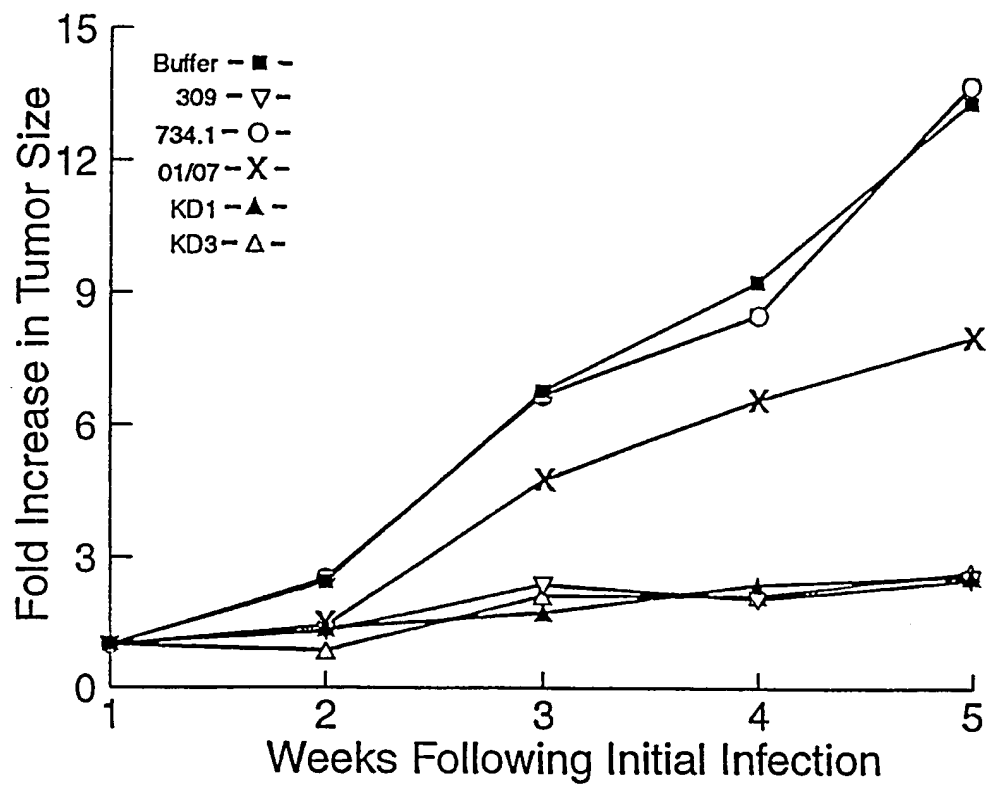


FIGURE 8A

8/66

One Injection of KD3 or GZ3 Inhibits
Growth of A549 tumors
(5×10^8 PFU injected on day 0)

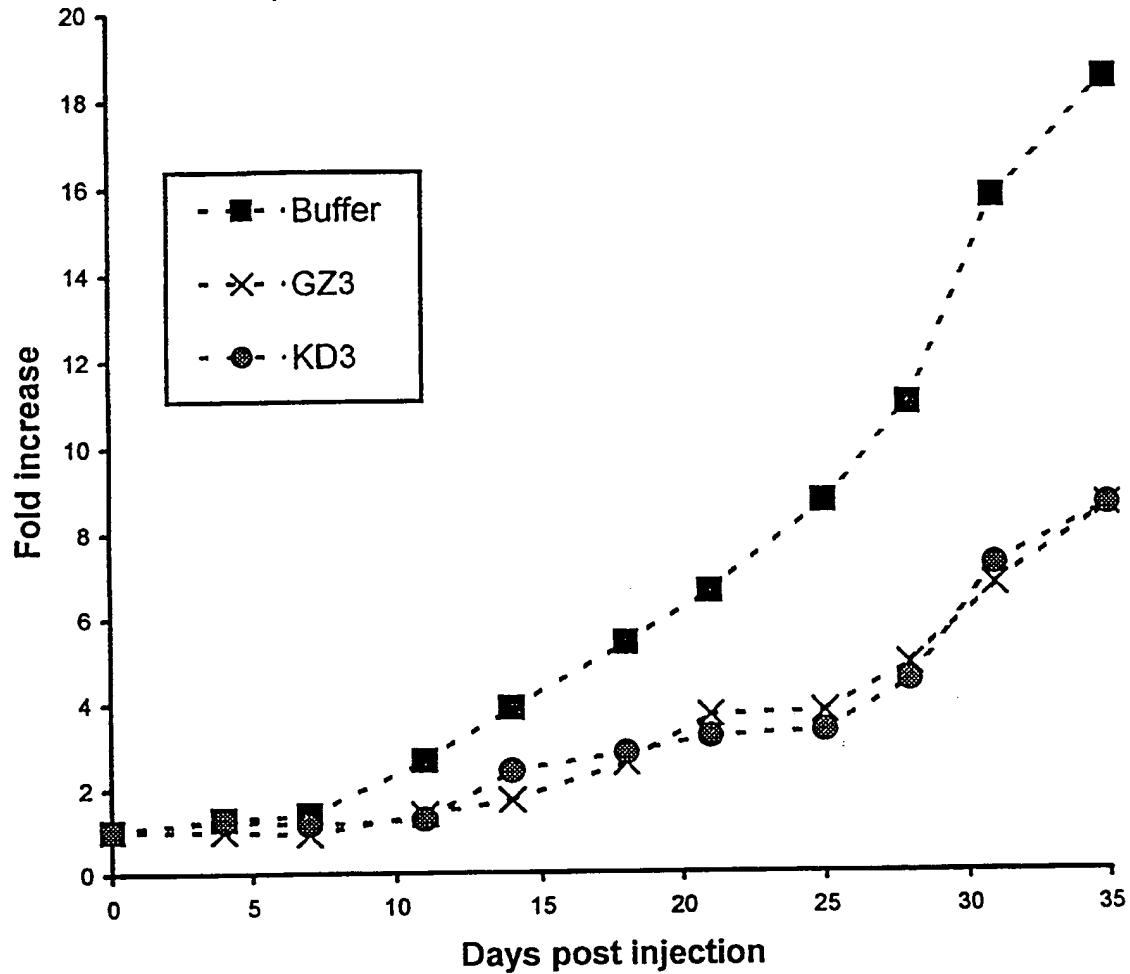


FIGURE 8B

9/60

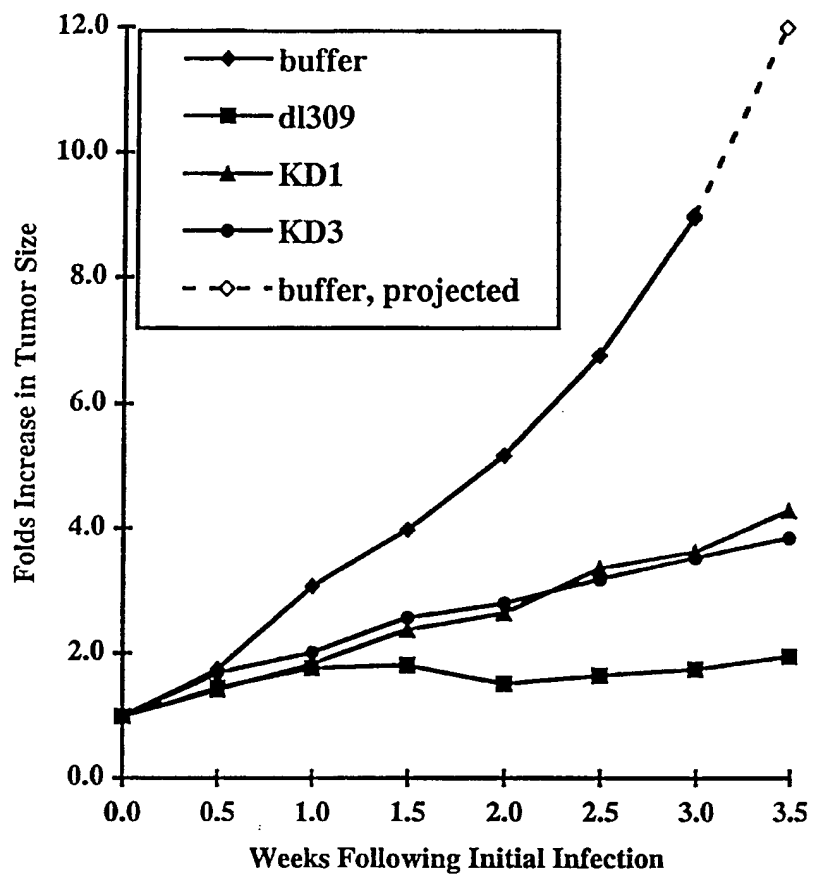


FIGURE 9

10/156

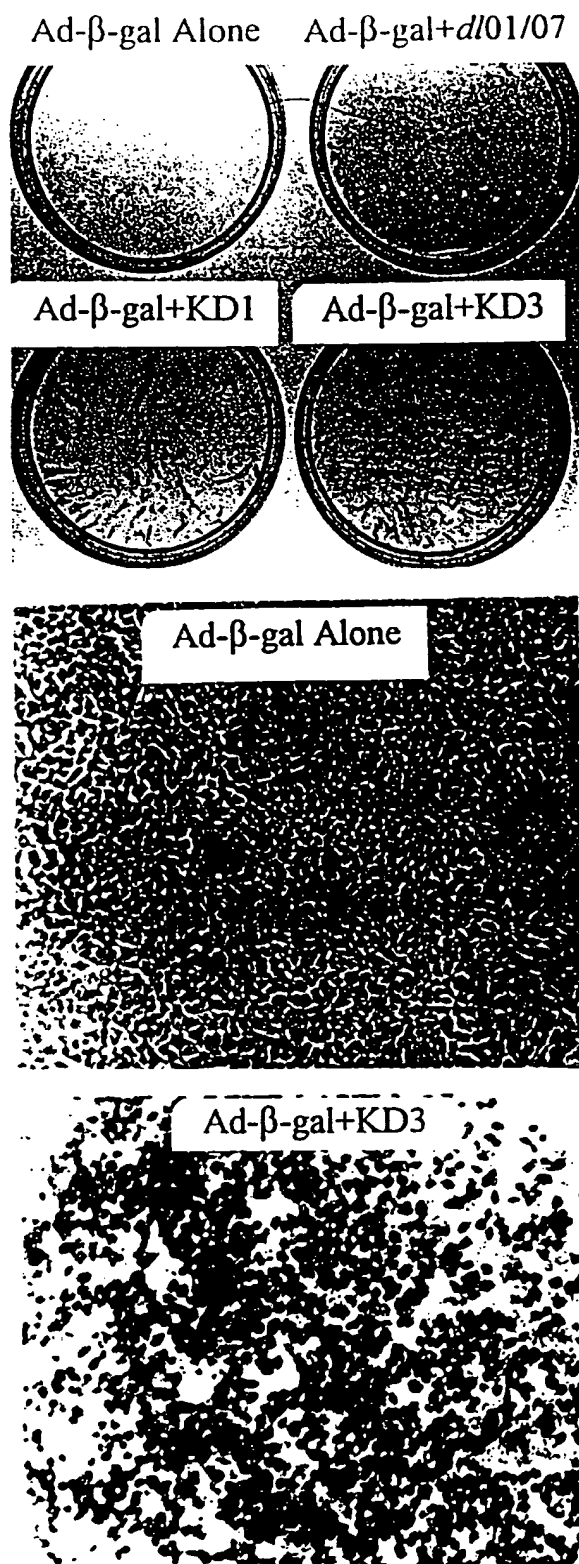


FIGURE 10

11/66

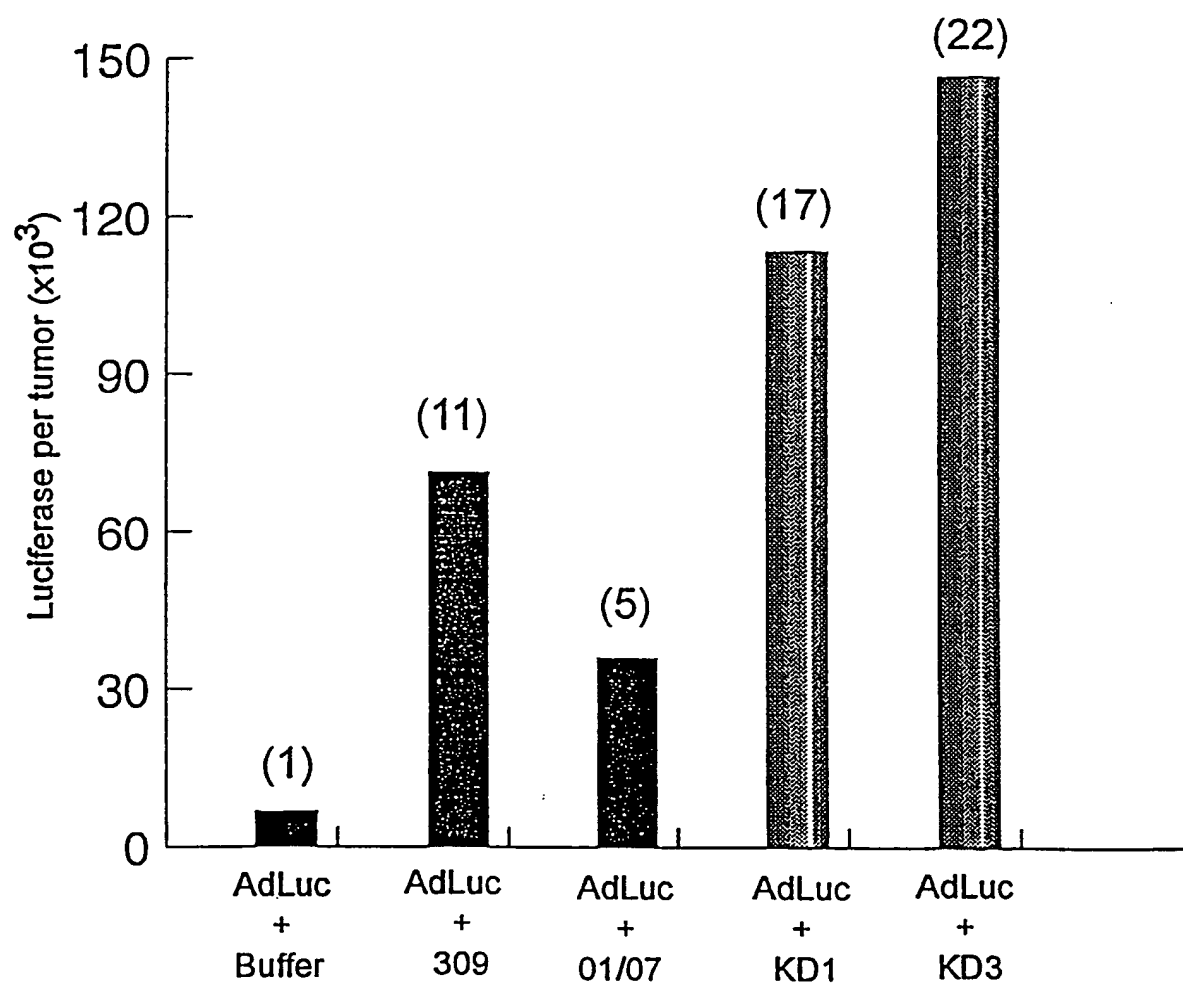


FIGURE 11

12/66

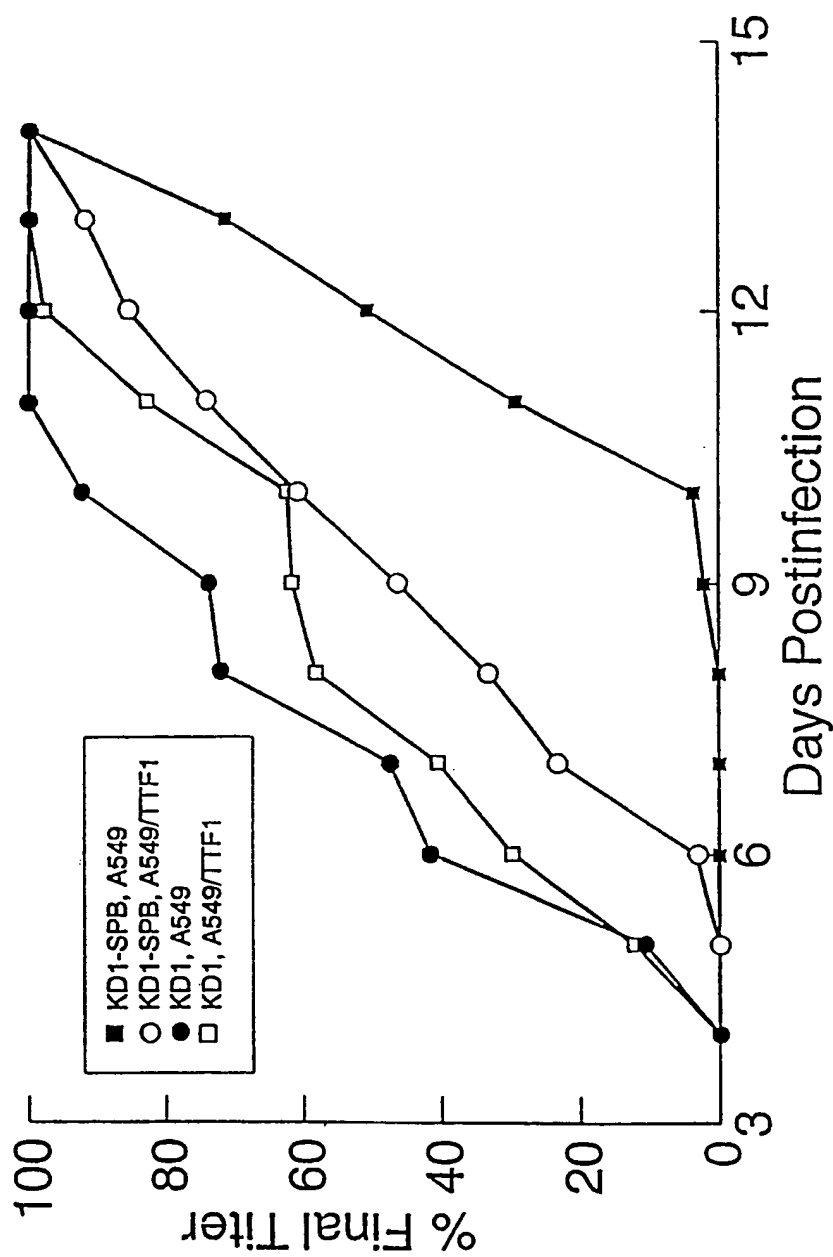


FIGURE 12

13/66

KD1-SPB With the SPB Promoter in Place of the E4 Promoter Grows on H44a Lung Cancer Cells with the TTF1 Transcription Factor

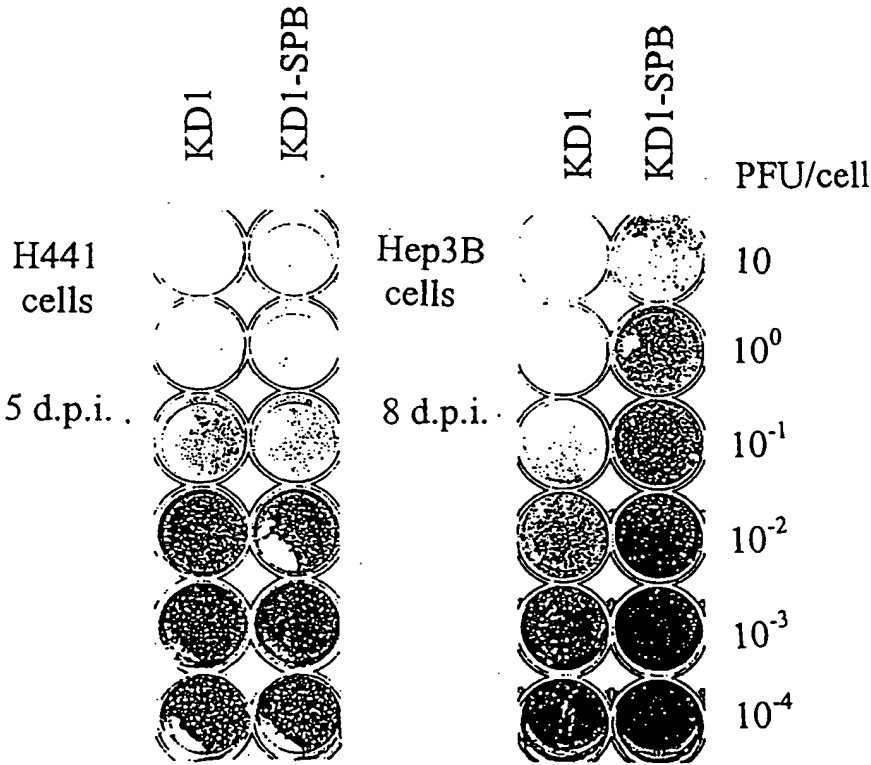


FIGURE 13

14/66

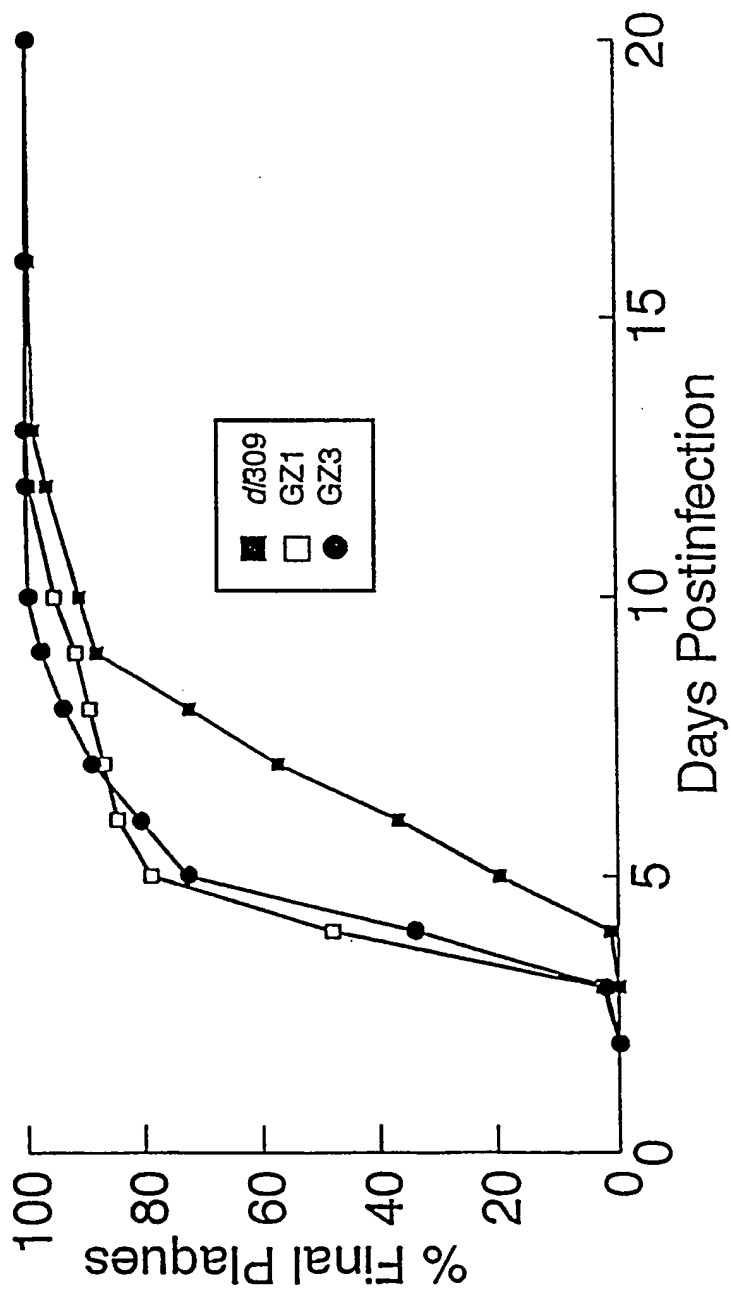


FIGURE 14

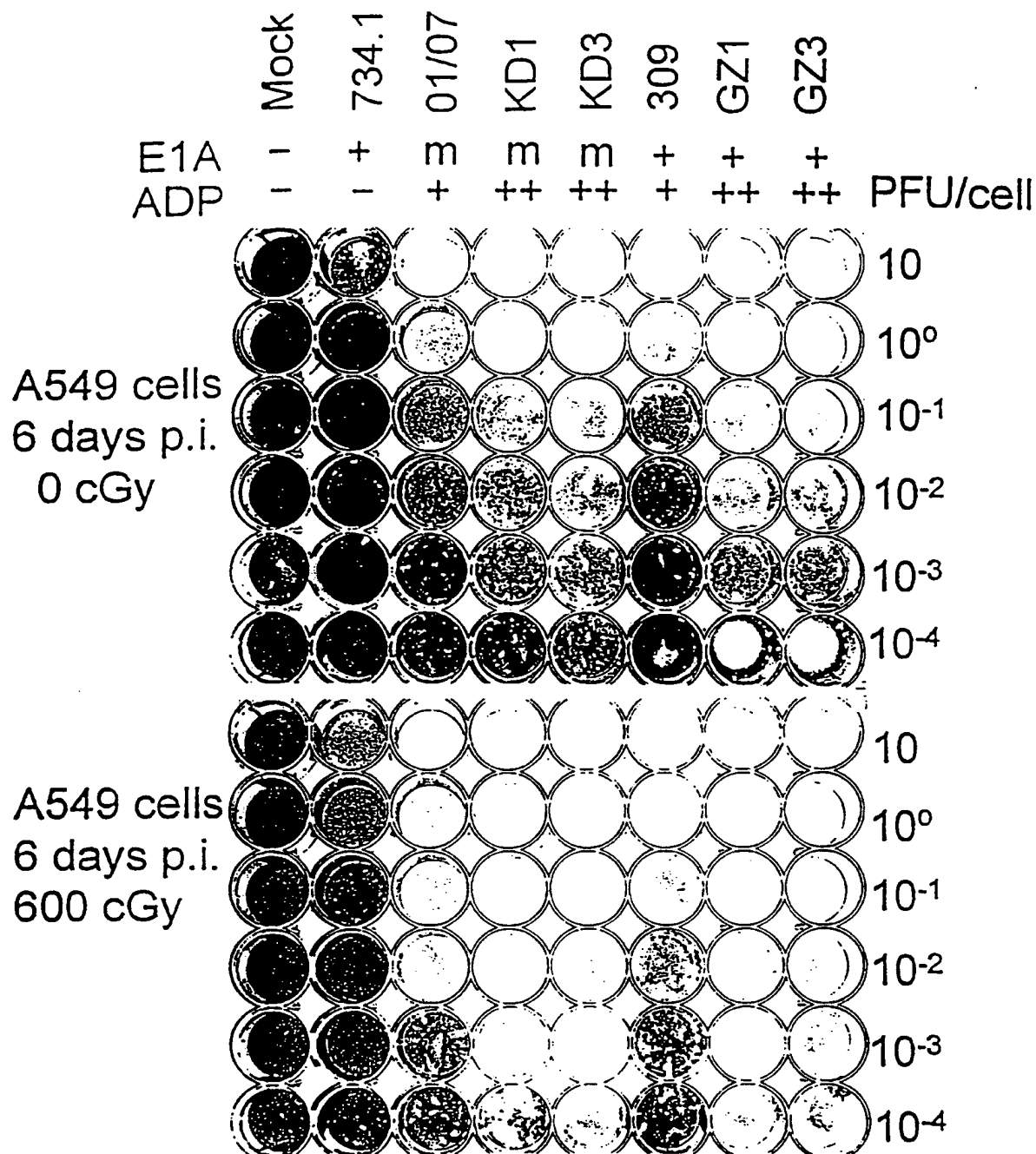


FIGURE 15

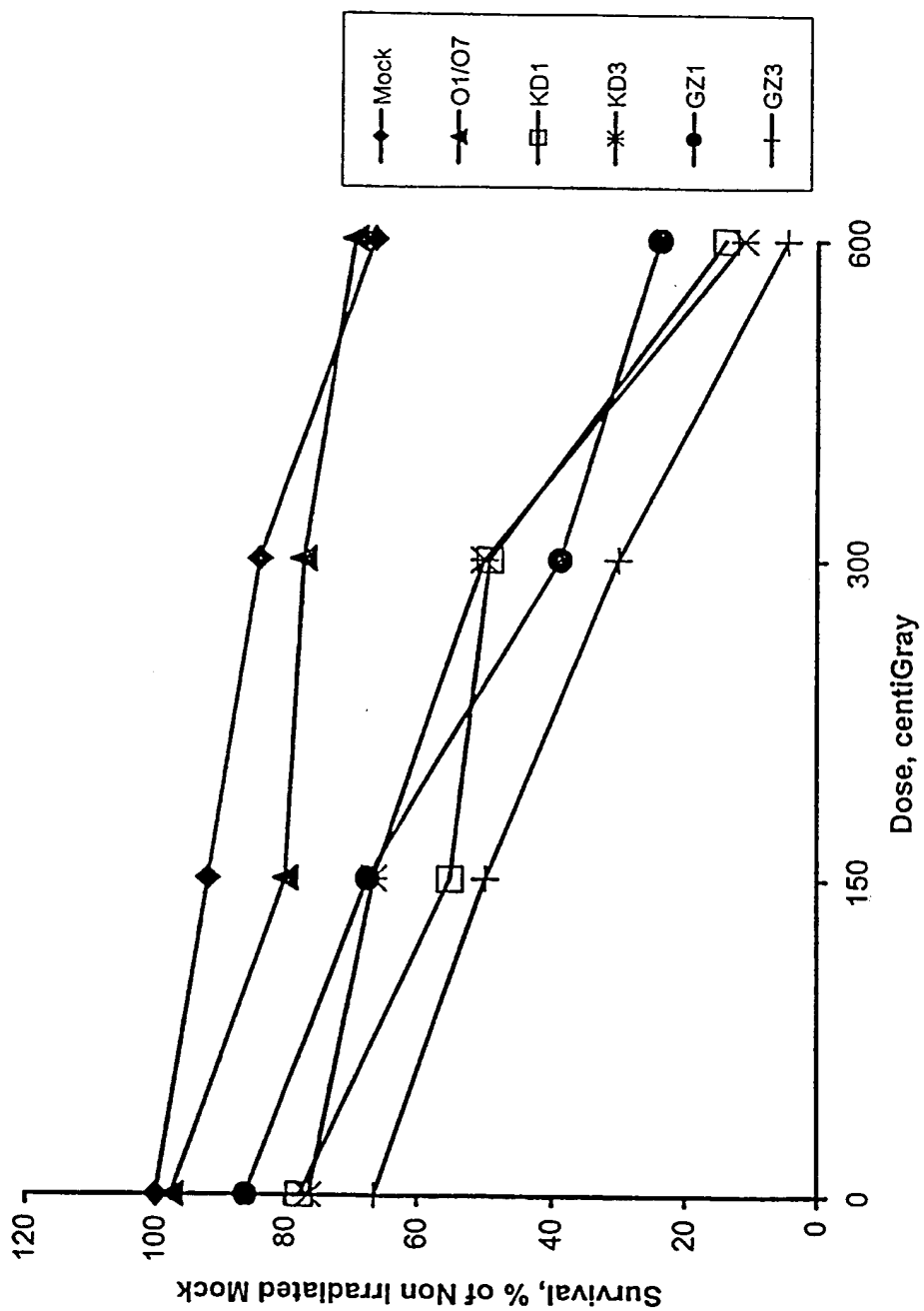


FIGURE 16

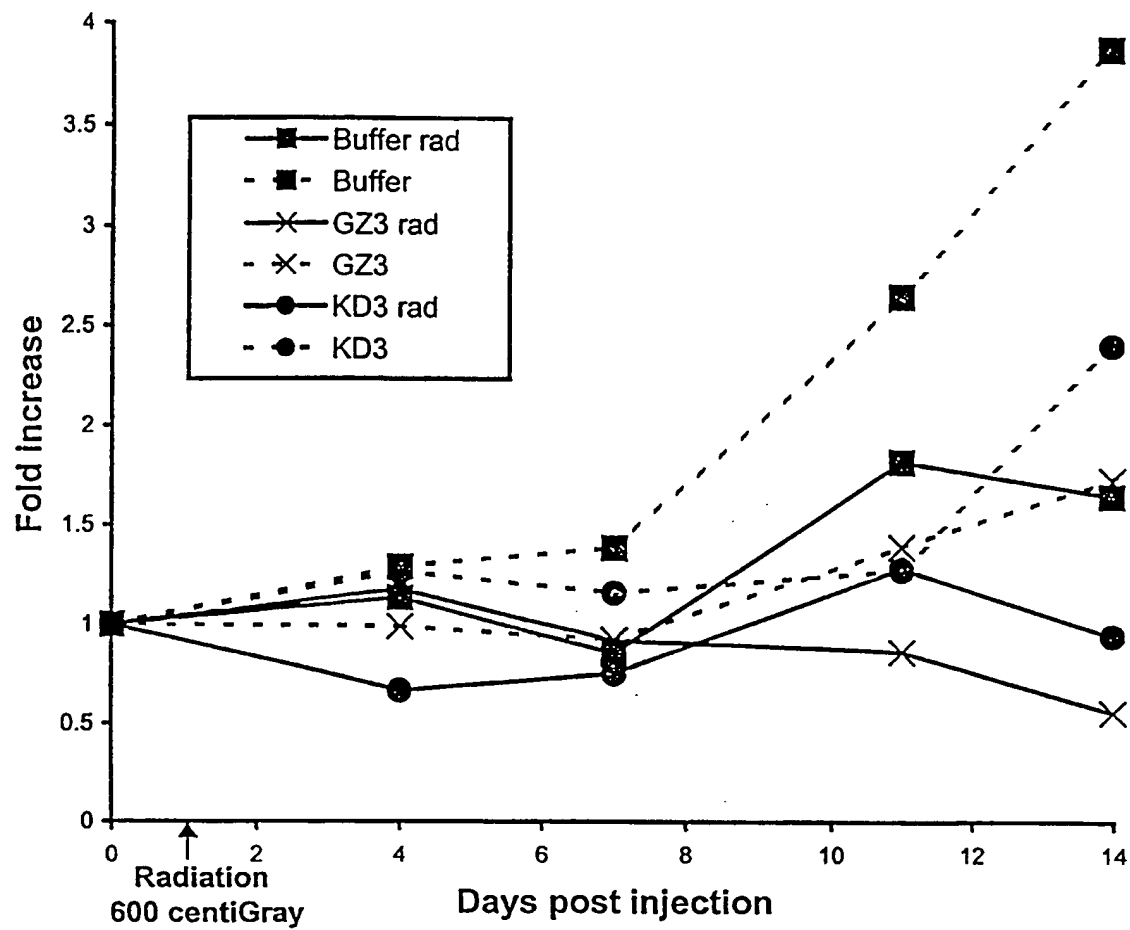


FIGURE 17

18/66

Ad2 Adenovirus Death Protein

Luminal Domain

MTGSTIAPTTIDYRNTTATGLTSALNLPQVHAFVND 35

O - glycosylation *N* - glycosylation

WASLDMWWFSIALMFVCLIMWLICCLKRRRRARPP 70

Transmembrane
(Signal - Anchor)

Basic - Proline

IYRPIIVLNPHNEKIHRLDGLKPCSLLLQYD 101

Cytoplasmic - Nucleoplasmic Domain

FIGURE 18A

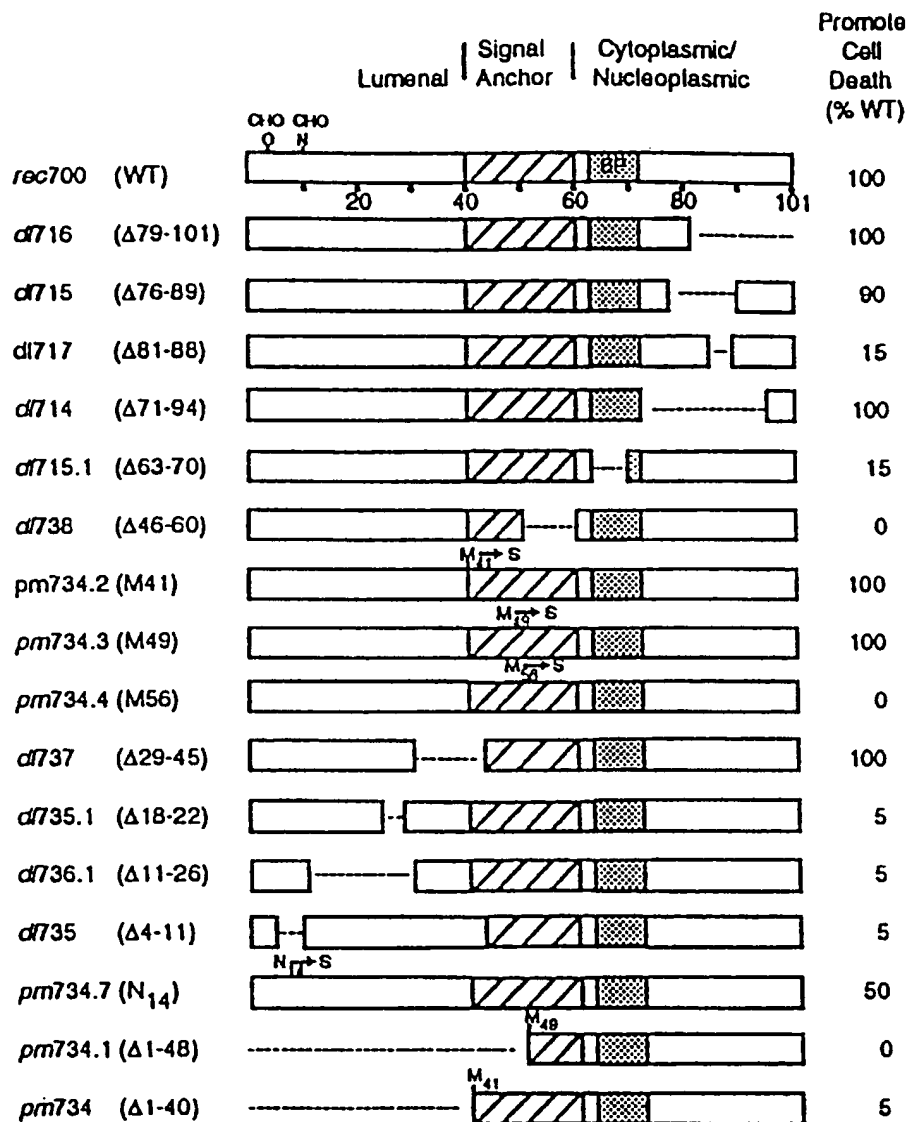


FIGURE 18B

20/66

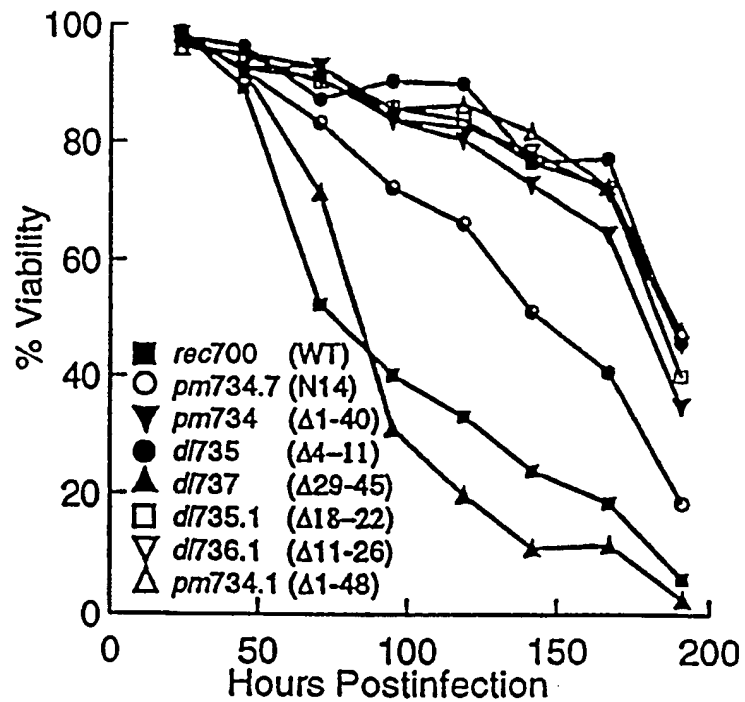


FIGURE 19A

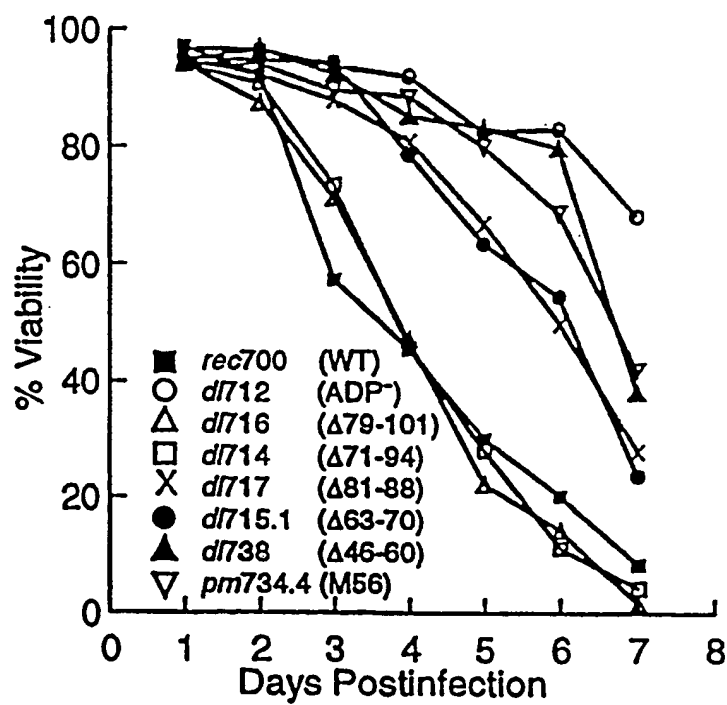


FIGURE 19B

Z1/66

Seq ID No.

		10	20	30	40	50
5	Ad1	-----MVD	T VNSYNTATGL	TSALNLPQVS	TFVNNWANLG	MWWFSIALMF
6	Ad2	MTGSTIAPTT	DYRNTTATGL	TSALNLPQVH	AFVNDWASLD	MWWFSIALMF
7	Ad5	-----MTN	TTNAAAATGL	TSTTNPQVS	AFVNNWDNLG	MWWFSIALMF
8	Ad6	-----MVD	T VNSYNTATGL	KSALNLPQVH	AFVNDWASLG	MWWFSIALMF
9	dl716	MTGSTIAPTT	DYRNTTATGL	TSALNLPQVH	AFVNDWASLD	MWWFSIALMF
10	dl715	MTGSTIAPTT	DYRNTTATGL	TSALNLPQVH	AFVNDWASLD	MWWFSIALMF
11	dl714	MTGSTIAPTT	DYRNTTATGL	TSALNLPQVH	AFVNDWASLD	MWWFSIALMF
12	dl737	MTGSTIAPTT	DYRNTTATGL	TSALNLPQ--	-----	-----IALMF

		60	70	80	90	100
5	Ad1	VCLIIMWLSC	CLKRKRARPP	IYKPIIVLNP	NNDGIHRLDG	LNTCSFSFAV -
6	Ad2	VCLIIMWLIC	CLKRRRARPP	IYRPIIVLNP	HNEKIHRLDG	LKPCSLLLQY D
7	Ad5	VCLIIMWLIC	CLKRKRARPP	IYSPIIVLHP	NNDGIHRLDG	LKHMFFSLTV -
8	Ad6	VCLIIMWLIC	CLKRRRARPP	IYRPIIVLNP	HNEKIHRLDG	LKPCSLLLQY D
9	dl716	VCLIIMWLIC	CLKRRRARPP	IYRPIIVL--	-----	-----
10	dl715	VCLIIMWLIC	CLKRRRARPP	IYRPI-----	-----G	LKPCSLLLQY D
11	dl714	VCLIIMWLIC	CLKRRRARPP	-----	-----	-----SLLLQY D
12	dl737	VCLIIMWLIC	CLKRRRARPP	IYRPIIVLNP	HNEKIHRLDG	LKPCSLLLQY D

Seq. ID No.

17	aa 1-40 of Ad2 ADP	MTGSTIAPTT DYRNTTATGL TSALNLPQVH AFVNDWASLD
18	aa 41-59 of Ad2 ADP	MWWFSIALMF VCLIIMWLI
19	aa 63-70 of Ad2 ADP	KRRRARPP
20	aa 60-101 of Ad2 ADP	C CLKRRRARPP IYRPIIVLNP HNEKIHRLDG LKPCSLLLQY D

FIGURE 20

22/66

LOCUS ad5 comple 35935 bp DNA SYN 06-FEB-1999
DEFINITION ad5 complete genome
ACCESSION ad5 comple
KEYWORDS .
SOURCE Unknown.
ORGANISM Unknown
Unclassified.
REFERENCE 1 (bases 1 to 35935)
AUTHORS Self
JOURNAL Unpublished.
BASE COUNT 8367 a 10073 c 9761 g 7734 t
ORIGIN
1 CATCATCAAT AATATACCTT ATTTTGGATT GAAGCCAATA TGATAATGAG GGGGTGGAGT
61 TTGTGACGTG GCGCGGGGCG TGGGAACGGG GCGGGTGACG TAGTAGTGTG GCGGAAGTGT
121 GATGTTGCAA GTGTGGCGGA ACACATGTAA GCGACGGATG TGGCAAAAGT GACGTTTTTG
181 GTGTGCGCCG GTGTACACAG GAAGTGACAA TTTTCGCGCG GTTTTAGGCG GATGTTGTAG
241 TAAATTTGGG CGTAACCGAG TAAGATTTGG CCATTTTCGC GGGAAACTG AATAAGAGGA
301 AGTGAAATCT GAATAATTTT GTGTTACTCA TAGCGCGTAA TATTTGTCTA GGGCCGCGG
361 GACTTTGACC GTTTACGTGG AGACTCGCCC AGGTGTTTTT CTCAGGTGTT TTCCGCGTTC
421 CGGGTCAAAG TTGGCGTTTT ATTATTATAG TCAGCTGACG TGTAAGTGTAT TTATACCCGG
481 TGAGTTCCTC AAGAGGCCAC TCTTGAGTGC CAGCGAGTAG AGTTTTCTCC TCCGAGCCGC
541 TCCGACACCG GGAAGTAAAA TGAGACATAT TATCTGCCAC GGAGGTGTTA TTACCGAAGA
601 AATGGCCGCC AGTCTTTTGG ACCAGCTGAT CGAAGAGGTA CTGGCTGATA ATCTTCCACC
661 TCCTAGCCAT TTTGAACCAC CTACCCTTCA CGAACTGTAT GATTTAGACG TGACGGCCCC
721 CGAAGATCCC AACGAGGAGG CCGTTTCGCA GATTTTCCCG GACTCTGTAA TGTTGGCGGT
781 GCAGGAAGGG ATTGACTTAC TCACTTTTCC GCCGGCGCCC GGTTCCTCCG AGCCGCTCA
841 CCTTTCCCGG CAGCCCGAGC AGCCGGAGCA GAGAGCCTTG GGTCCGGTTT CTATGCCAAA
901 CCTTGATACG GAGGTGATCG ATCTTACCTG CCACGAGGCT GGCTTCCAC CCAGTGACGA
961 CGAGGATGAA GAGGGTGAGG AGTTTGTGTT AGATTATGTG GAGCACCCCG GGCACGGTTG
1021 CAGGTCTTGT CATTATCACC GGAGGAATAC GGGGGACCCA GATATTATGT GTTCGCTTTG
1081 CTATATGAGG ACCTGTGGCA TGTTTGTCTA CAGTAAGTGA AAATTATGGG CAGTGGGTGA
1141 TAGAGTGGTG GGTTTGGTGT GGTAATTTTT TTTTAAATTT TTACAGTTTT GTGTTTTAAA
1201 GAATTTTGTA TTGTGATTTT TTTAAAGAGT CCGTGTCTCG AACCTGAGCC TGAGCCCGAG
1261 CCAGAACCGG AGCCTGCAAG ACCTACCCGC CGTCTAAAAA TGGCGCCTGC TATCCTGAGA
1321 CGCCCGACAT CACCTGTGTC TAGAGAATGC AATAGTAGTA CGGATAGCTG TGACTCCGGT
1381 CCTTCTAACA CACCTCCTGA GATACACCCG GTGGTCCCGC TGTGCCCCAT TAAACCAGTT
1441 GCCGTGAGAG TTGGTGGGCG TCGCCAGGCT GTGGAATGTA TCGAGGACTT GCTTAACGAG
1501 CCTGGGCAAC CTTTGACTT GAGCTGTAAA CGCCCCAGGC CATAAGGTGT AAACCTGTGA
1561 TTGCGTGTGT GGTTAACGCC TTTGTTTGGT GAATGAGTTG ATGTAAGTTT AATAAAGGGT
1621 GAGATAATGT TTAACCTGCA TGGCGTGTTA AATGGGGCGG GGCTTAAAGG GTATATAATG
1681 CGCCGTGGGC TAATCTTGGT TACATCTGAC CTCATGGAGG CTTGGGAGTG TTTGGAAGAT
1741 TTTTCTGCTG TGCGTAACTT GCTGGAACAG AGCTCTAACA GTACCTCTTG GTTTTGGAGG
1801 TTTCTGTGGG GCTCATCCCA GGCAAAGTTA GTCTGCAGAA TTAAGGAGGA TTACAAGTGG
1861 GAATTTGAAG AGCTTTTGAA ATCCTGTGGT GAGCTGTTTG ATTCTTTGAA TCTGGGTAC
1921 CAGGCGCTTT TCCAAGAGAA GGTATCAAG ACTTTGGATT TTTCCACACC GGGGCGCGCT
1981 GCGGCTGCTG TTGCTTTTTT GAGTTTATA AAGGATAAAT GGAGCGAAGA AACCCATCTG
2041 AGCGGGGGGT ACCTGTGGA TTTTCTGGCC ATGCATCTGT GGAGAGCGGT TGTGAGACAC
2101 AAGAATCGCC TGCTACTGTT GTCTTCCGTC CGCCCGGCGA TAATACCGAC GGAGGAGCAG
2161 CAGCAGCAGC AGGAGGAAGC CAGGCGGCGG CGGCAGGAGC AGAGCCCATG GAACCCGAGA
2221 GCCGCGCTGG ACCCTCGGGA ATGAATGTTG TACAGGTGGC TGAACGTAT CCAGAACTGA
2281 GACGCATTTT GACAAATTACA GAGGATGGGC AGGGGCTAAA GGGGTAAAG AGGGAGCGGG
2341 GGGCTTGTGA GGCTACAGAG GAGGCTAGGA ATCTAGCTTT TAGCTTAATG ACCAGACACC
2401 GTCCTGAGTG TATTACTTTT CAACAGATCA AGGATAATTG CGCTAATGAG CTTGATCTGC
2461 TGGCGCAGAA GTATTCCATA GAGCAGCTGA CCACTTACTG GCTGCAGCCA GGGGATGATT
2521 TTGAGGAGGC TATTAGGGTA TATGCAAAGG TGGCACTTAG GCCAGATTGC AAGTACAAGA
2581 TCAGCAAAC TGTAAATATC AGGAATTGTT GCTACATTTT TGGGAACGGG GCCGAGGTGG
2641 AGATAGATAC GGAGGATAGG GTGGCCTTTA GATGTAGCAT GATAAATATG TGGCCGGGGG

ad5

FIGURE 21
(SHEET 1)

23/66

```

2701 TGCTTGGCAT GGACGGGGTG GTTATTATGA ATGTAAGGTT TACTGGCCCC AATTTTAGCG
2761 GTACGGTTTTT CCTGGCCAAT ACCAACCTTA TCCTACACGG TGTAAGCTTC TATGGGTTTA
2821 ACAATACCTG TGTGGAAGCC TGGACCGATG TAAGGGTTCG GGGCTGTGCC TTTTACTGCT
2881 GCTGGAAGGG GGTGGTGTGT CGCCCCAAAA GCAGGGCTTC AATTAAGAAA TGCCTCTTTG
2941 AAAGGTGTAC CTTGGGTATC CTGTCTGAGG GTAACCTCAG GGTGCGCCAC AATGTGGCCT
3001 CCGACTGTGG TTGCTTCATG CTAGTGAAAA GCGTGGCTGT GATTAAGCAT AACATGGTAT
3061 GTGGCAACTG CGAGGACAGG GCCTCTCAGA TGCTGACCTG CTCGGACGGC AACTGTCACC
3121 TGCTGAAGAC CATTACGTA GCCAGCCACT CTCGCAAGGC CTGGCCAGTG TTGAGCATA
3181 ACATACTGAC CCGCTGTTCC TTGCATTTGG GTAACAGGAG GGGGGTGTTC CTACCTTACC
3241 AATGCAATTT GAGTCACACT AAGATATTGC TTGAGCCCGA GAGCATGTCC AAGGTGAACC
3301 TGAACGGGGT GTTTGACATG ACCATGAAGA TCTGGAAGGT GCTGAGGTAC GATGAGACCC
3361 GCACCAGGTG CAGACCCCTG GAGTGTGGCG GTAAACATAT TAGGAACCGA CCTGTGATGC
3421 TGGATGTGAC CGAGGAGCTG AGGCCCGATC ACTTGGTGCT GGCTGCACC CGCGCTGAGT
3481 TTGGCTCTAG CGATGAAGAT ACAGATTGAG GTACTGAAAT GTGTGGGCGT GGCTTAAGGG
3541 TGGGAAAGAA TATATAAGGT GGGGGTCTTA TGTAGTTTTG TATCTGTTTT GCAGCAGCCG
3601 CCGCCGCCAT GAGCACCAC TCCTTTGATG GAAGCATTGT GAGCTCATAT TTGACAACGC
3661 GCATGCCCCC ATGGGCCGGG GTGCGTCAGA ATGTGATGGG CTCCAGCATT GATGGTCGCC
3721 CCGTCTGCC CGCAAACCTC ACTACCTTGA CCTACGAGAC CGTGTCTGGA ACGCGTTGG
3781 AGACTGCAGC CTCGCCCGCC GCTTCAGCCG CTGCAGCCAC CGCCCGCGGG ATTGTGACTG
3841 ACTTTGCTTT CCTGAGCCCG CTTGCAAGCA GTGCAGCTTC CCGTTCATCC GCGCGCATG
3901 ACAAGTTGAC GGCTCTTTTG GCACAATTGG ATTCTTTGAC CCGGGAACCT AATGTCGTTT
3961 CTCAGCAGCT GTTGGATCTG CGCCAGCAGG TTTCTGCCCT GAAGGCTTCC TCCCTCCCA
4021 ATGCGGTTTA AAACATAAAT AAAAAACCAG ACTCTGTTTG GATTTGGATC AAGCAAGTGT
4081 CTTGCTGTCT TTATTTAGGG GTTTTGC GCGCGTAGGC CCGGACCAG CCGTCTCGGT
4141 CGTTGAGGGT CCTGTGTATT TTTTCCAGGA CGTGGTAAAG GTGACTCTGG ATGTTGAGAT
4201 ACATGGGCAT AAGCCCCTCT CTGGGGTGGA GGTAGCACCA CTGCAGAGCT TCATGCTGCG
4261 GGGTGGTGTT GTAGATGATC CAGTCGTAGC AGGAGCGCTG GCGGTGGTGC CTAATAATGT
4321 CTTTCAGTAG CAAGCTGATT GCCAGGGGCA GGCCCTTGGT GTAAGTGTTC ACAAGCGGT
4381 TAAGCTGGA TGGGTGCATA CGTGGGGATA TGAGATGCAT CTTGGACTGT ATTTTTAGGT
4441 TGGCTATGTT CCCAGCCATA TCCCTCCGGG GATTCATGTT GTGCAGAAC ACCAGCACAG
4501 TGTATCCGGT GCACTTGGA AATTGTGCAT GTAGCTTAGA AGGAAATGCG TGAAGAACT
4561 TGGAGACGCC CTTGTGACCT CCAAGATTTT CCATGCATTC GTCCATAATG ATGGCAATGG
4621 GCCCACGGGC GCGGCTTGG GCGAAGATAT TTCTGGGATC ACTAACGTCA TAGTTGTGTT
4681 CCAGGATGAG ATCGTCATAG GCCATTTTAA CAAAGCGCGG GCGGAGGGTG CCAGACTGCG
4741 GTATAATGGT TCCATCCGGC CCAGGGGCGT AGTTACCCTC ACAGATTTGC ATTTCCCACG
4801 CTTTGAGTTC AGATGGGGG ATCATGTCTA CCTGCGGGGC GATGAAGAAA ACGGTTTCCG
4861 GGGTAGGGGA GATCAGCTGG GAAGAAAGCA GGTTCCCTGAG CAGCTGCGAC TTACCGCAGC
4921 CCGTGGGCCC GTAAATCACA CCTATTACCG GGTGCAACTG GTAGTTAAGA GAGCTGCAGC
4981 TGCCGTCATC CTTGAGCAGG GGGGCCACTT CGTTAAGCAT GTCCCTGACT CGCATGTTTT
5041 CCCTGACCAA ATCCGCCAGA AGGCGCTCGC CGCCAGCGA TAGCAGTTCT TGCAAGGAAG
5101 CAAAGTTTTT CAACGGTTTG AGACCGTCCG CCGTAGGCAT GCTTTTGAGC GTTTGACCAA
5161 GCAGTTCCAG GCGGTCCAC AGCTCGGTCA CCTGCTCTAC GGCATCTCGA TCCAGCATAT
5221 CTCTCTGTTT CGCGGGTTGG GCGGGCTTTC GCTGTACGGC AGTAGTCGGT GCTCGTCCAG
5281 ACGGGCCAGG GTCATGTCTT TCCACGGGCG CAGGGTCTCT GTGAGCGTAG TCTGGGTCAC
5341 GGTGAAGGGG TGCGCTCCGG GCTGCGCGCT GGCCAGGGTG CGCTTGAGGC TGGTCTGCT
5401 GGTGCTGAAG CGCTGCCGGT CTTGCGCGCT CCGTCCGGC AGGTAGCATT TGACCATGGT
5461 GTCATAGTCC AGCCCCTCCG CCGCGTGGCC CTTGGCGCGC AGCTTGCCCT TGGAGGAGGC
5521 GCCGCACGAG GGGCAGTGCA GACTTTTGAG GCGTAGAGC TTGGGCGCGA GAAATACCGA
5581 TTCCGGGGAG TAGGCATCCG CGCCGAGGC CCCGAGACG GTCTCGCATT CCACGAGCCA
5641 GGTGAGCTCT GGCCGTTCCG GGTCAAAAAC CAGGTTTCCC CCATGCTTTT TGATGCGTTT
5701 CTTACCTCTG GTTTCCATGA GCGGTGTCC ACCTCGGTG ACGAAAAGGC TGTCCGTGTC
5761 CCCGTATACA GACTTGAGAG GCCTGTCTCT GAGCGGTGTT CCGCGGTCTT CCTCGTATAG
5821 AAACCTCGAC CACTCTGAGA CAAAGGCTCG CGTCCAGGCC AGCACGAAGG AGGCTAAGTG
5881 GGAGGGGTAG CCGTCTGTGT CCACTAGGGG GTCCACTCGC TCCAGGGTGT GAAGACACAT
5941 GTCGCCCTCT TCGGCATCAA GGAAGGTGAT TGGTTTGTAG GTGTAGGCCA CGTGACCGGG
6001 TGTTCTCTGAA GGGGGGCTAT AAAAGGGGGT GGGGGCGCGT TCGTCTCAC TCTCTCCGC
6061 ATCGCTGTCT GCGAGGGCCA GCTGTTGGGG TGAGTACTCC CTCTGAAAAG CCGGCATGAC

```

```

6121 TTCTGCGCTA AGATTGTCAG TTTCCAAAAA CGAGGAGGAT TTGATATTCA CCTGGCCCCG
6181 GGTGATGCCT TTGAGGGTGG CCGCATCCAT CTGGTCAGAA AAGACAATCT TTTTGTGTGTC
6241 AAGCTTGGTG GCAAACGACC CGTAGAGGGC GTTGACAGC AACTTGGCGA TGGAGCGCAG
6301 GGTTTGGTTT TTGTGCGGAT CGGCGCGCTC CTTGGCCGCG ATGTTTAGCT GCACGTATTC
6361 GCGCGCAACG CACCGCCATT CGGGAAGAC GGTGGTGGC TCGTCGGGCA CCAGGTGCAC
6421 GCGCCAACCG CGGTTGTGCA GGGTGACAAG GTCAACGCTG GTGGCTACCT CTCCGCGTAG
6481 GCGCTCGTTG GTCCAGCAGA GGCGCCGCC CTTGCGCGAG CAGAATGGCG GTAGGGGGTC
6541 TAGTGCCTG TCGTCCGGG GGTCTGCGTC CACGGTAAAG ACCCCGGGCA GCAGGCGCGC
6601 GTCGAAGTAG TCTATCTTGC ATCCTTGCAA GTCTAGCGCC TGCTGCCATG CGCGGGCGGC
6661 AAGCGCGCGC TCGTATGGGT TGAGTGGGG ACCCCATGGC ATGGGGTGGG TGAGCGCGGA
6721 GGCGTACATG CCGCAAATGT CGTAAACGTC GAGGGGCTCT CTGAGTATTC CAAGATATGT
6781 AGGGTAGCAT CTTCCACGCG GGATGCTGGC GCGCACGTAA TCGTATAGTT CGTGCGAGGG
6841 AGCGAGGAGG TCGGGACCGA GGTGTGCTAC GCGGGGCTGC TCTGCTCGGA AGACTATCTG
6901 CCTGAAGATG GCATGTGAGT TGGATGATAT GGTGGACGCG TGAAGACGCT TGAAGCTGGC
6961 GTCTGTGAGA CCTACCGCGT CACGCACGAA GGAGGCGTAG GAGTCGCGCA GCTTGTGAC
7021 CAGCTCGCGG GTGACCTGCA CGTCTAGGGC GCAGTAGTCC AGGGTTTCCT TGATGATGTC
7081 ATACTTATCC TGTCCCTTTT TTTTCCACAG CTCGCGTTG AGGACAACT CTTCCGCGTC
7141 TTTCCAGTAC TCTTGGATCG GAAACCCGTC GGCCTCCGAA CGGTAAAGAGC CTAGCATGTA
7201 GAACCTGGTG ACGGCCTGGT AGGCGCAGCA TCCCTTTTCT ACGGGTAGCG CGTATGCCTG
7261 CGCGGCCCTC CGGAGCGAGG TGTGGGTGAG CGCAAAGGTG TCCCTGACCA TGACTTTGAG
7321 GTACTGGTAT TTGAAGTCAG TGTCTGCGCA TCCGCCCTGC TCCCAGAGCA AAAAGTCCGT
7381 GCGCTTTTGG GAACGCGGAT TTGGCAGGGC GAAGGTGACA TCGTTGAAGA GTATCTTTCC
7441 CGCGCGAGGC ATAAAGTTGC GTGTGATGCG GAAGGGTCCC GGCACCTCGG AACGGTTGTT
7501 AATTACCTGG GCGGCGAGCA CGATCTCGTC AAAGCCGTG ATGTTGTGGC CCACAATGTA
7561 AAGTTCCAAG AAGCGCGGGA TGCCCTTGAT GGAAGGCAAT TTTTAAAGTT CCTCGTAGGT
7621 GAGCTCTTCA GGGGAGCTGA GCCCCTGCTC TGAAAGGGCC CAGTCTGCAA GATGAGGGTT
7681 GGAAGCGACG AATGAGCTCC ACAGGTCACG GGCCATTAGC ATTTGCAGGT GGTGCGGAAA
7741 GGTCCTAAAC TGGCGACCTA TGGCCATTTC TTCTGGGGTG ATGCAGTAGA AGGTAAGCGG
7801 GTCTTGTTC CAGCGGTCCC ATCCAAGGTT CGCGGCTAGG TCTCGCGCGG CAGTCACTAG
7861 AGGCTCATCT CCGCCGAATC TCATGACCAG CATGAAGGGC ACGAGCTGCT TCCCAAAGGC
7921 CCCCATCCAA GTATAGGTCT CTACATCGTA GGTGACAAAG AGACGCTCGG TGCGAGGATG
7981 CGAGCCGATC GGAAGAACT GGTCTCCCG CCACCAATTG GAGGAGTGGC TATTGATGTG
8041 GTGAAAGTAG AAGTCCCTGC GACGGGCCGA ACACTCGTGC TGGCTTTTGT AAAAACGTGC
8101 GCAGTACTGG CAGCGGTGCA CGGGCTGTAC ATCCTGCACG AGGTTGACCT GACGACCGCG
8161 CACAAGGAAG CAGAGTGGGA ATTTGAGCCC CTCGCCTGGC GGGTTTGGCT GGTGGTCTTC
8221 TACTTCGGCT GCTTGTCTTC GACCGTCTGG CTGCTCGAGG GGAGTTACGG TGGATCGGAC
8281 CACCACGCGC CGCGAGCCCA AAGTCCAGAT GTCCGCGCGC GCGGTCGGA GCTTGATGAC
8341 AACATCGCGC AGATGGGAGC TGTCCATGGT CTGGAGCTCC CGCGGCGTCA CCGAGGCGG
8401 GAGTCCCTGC AGGTTTACCT CGCATAGACG GGTGAGGGCG CGGGCTAGAT CCAGGTGATA
8461 CCTAATTTC AGGGGCTGGT TGGTGGCGGC GTCGATGGCT TGCAAGAGGC CGCATCCCCG
8521 CGGCGCGACT ACGGTACCGC GCGGCGGGCG GTGGGCCGCG GGGGTGTCCT TGGATGATGC
8581 ATCTAAAAGC GGTGACGCGG GCGAGCCCCC GGAGGTAGGG GGGGCTCCGG ACCCGCCGGG
8641 AGAGGGGGCA GGGGCACGTC GGCGCCGCGC GCGGGCAGGA GCTGGTGTG CTGCGGTGAA
8701 TTGCTGGCGA ACGCGACGAC GCGGCGGTTG ATCTCCTGAA TCTGGCGCCT CTGCGTGAAG
8761 ACGACGGGCC CGGTGAGCTT GAGCCTGAAA GAGAGTTTCA CAGAATCAAT TTCGGTGTG
8821 TTGACGGCGG CCTGGCGCAA AATCTCCTGC ACGTCTCCTG AGTTGTCTTG ATAGGCGATC
8881 TCGGCCATGA ACTGCTCGAT CTCTTCTTCC TGGAGATCTC CGCGTCCGGC TCGCTCCACG
8941 GTGGCGGCGA GGTGCTTGA AATGCGGGCC ATGAGCTGCG AGAAGGCGTT GAGGCCTCCC
9001 TCGTTCCAGA CGCGGCTGTA GACCACGCCC CCTTCGGCAT CGCGGGCGCG CATGACCACC
9061 TGCGCGAGAT TGAGCTCCAC GTGCCGGGCG AAGACGGCGT AGTTTCGCG AGCTGAAAG
9121 AAGTAGTTGA GGGTGGTGGC GGTGTGTTCT GCCACGAAGA AGTACATAAC CCAGCGTCGC
9181 AACGTGGATT CGTTGATATC CCCCAGGGCC TCAAGGCGCT CCATGGCCTC GTAGAAGTCC
9241 ACGGCGAAGT TGAAAACTG GGAGTTGCGC GCCGACACGG TTAACCTCTC CTCCAGAAGA
9301 CGGATGAGCT CGGCGACAGT GTCGCGCACC TCGCGCTCAA AGGCTACAGG GGCTCTTCT
9361 TCTTCTTCAA TCTCCTCTTC CATAAGGGCC TCCCTTCTT CTCTTCTG GCGCGGTGGG
9421 GGAGGGGGGA CACGGCGGCG ACGACGGCGC ACCGGGAGGC GGTGACAAA GCGCTCGATC
9481 ATCTCCCGC GCGACGGCG CATGGTCTCG GTGACGGCGC GGCCGTCTC GCGGGGCGC

```

FIGURE 21
(SHEET 3)

```

9541 AGTTGGAAGA CGCCGCCCGT CATGTCCCGG TTATGGGTTG GCGGGGGGCT GCCATGCGGG
9601 AGGGATACGG CGCTAACGAT GCATCTCAAC AATTGTTGTG TAGGTACTCC GCCGCCGAGG
9661 GACCTGAGCG AGTCCGCATC GACCCGATCG GAAAACCTCT CGAGAAAGGC GTCTAACGAG
9721 TCACAGTCGC AAGGTAGGCT GAGCACCCTG GCGGGCGGCA GCGGGCGGCG GTCGGGGTTG
9781 TTTCTGGCGG AGGTGCTGCT GATGATGTAA TTAAAGTAGG CGGTCTTGAG ACGGCGGATG
9841 GTCGACAGAA GCACCATGTC CTTGGGTCCG GCCTGCTGAA TGCAGGCGG GTCGGCCATG
9901 CCCCAGGCTT CGTTTTGACA TCGGCGCAGG TCTTTGTAGT AGTCTTGCAT GAGCCTTTCT
9961 ACCGGCACTT CTTCTTCTCC TTCCTCTTGT CCTGCATCTC TTGCATCTAT CGCTGCGGCG
10021 GCGGCGGAGT TTGGCCGTAG GTGGCGCCCT CTTCTCTCCA TGCCTGTGAC CCCGAAGCCC
10081 CTCATCGGCT GAAGCAGGGC TAGGTCCGGC ACAACGCGCT CGGCTAATAT GGCCTGCTGC
10141 ACCTGCGTGA GGGTAGACTG GAAGTCATCC ATGTCCACAA AGCGGTGGTA TGCGCCCGTG
10201 TTGATGGTGT AAGTGCAGTT GGCCATAACG GACCAGTTAA CGGTCTGGTG ACCCGGCTGC
10261 GAGAGCTCGG TGTACCTGAG ACGCGAGTAA GCCCTCGAGT CAAATACGTA GTCGTTGCAA
10321 GTCCGCACCA GGTACTGGTA TCCCACCAA AAGTGCGGCG GCGGCTGGCG GTAGAGGGGC
10381 CAGCGTAGGG TGGCCGGGGC TCCGGGGGCG AGATCTTCCA ACATAAGGCG ATGATATCCG
10441 TAGATGTACC TGGACATCCA GGTGATGCCG GCGGCGGTGG TGGAGGCGCG CGGAAAGTCG
10501 CCGACGCGGT TCCAGATGTT GCGCAGCGGC AAAAAGTGCT TAGACCGTGC AAAAGGAGAG CCTGTAAGCG
10561 CCGGTACAGC GCGCGCAATC GTTGACGCTC TGGATAAATT CGCAAGGGTA TCATGGCGGA CGACCGGGGT
10621 GGCACCTTTC CGTGGTCTGG TGGATAAATT CGCAAGGGTA TCATGGCGGA CGACCGGGGT
10681 TCGAGCCCGG TATCCGGCCG TCCGCGGTGA TCCATGCGGT TACCGCCCGC GTGTCGAACC
10741 CAGGTGTGCG ACGTCAGACA ACGGGGGAGT GCTCCTTTTG GCTTCTTCC AGGCGCGGCG
10801 GCTGCTGCGC TAGCTTTTTT GGCCACTGGC CGCGCGCAGC GTAAGCGGTT AGGCTGGAAA
10861 GCGAAAGCAT TAAGTGGCTC GCTCCCTGTA GCCGGAGGGT TATTTTCCAA GGGTTGAGTC
10921 GCGGGACCCC CGGTTTCGAGT CTCGGACCGG CCGGACTGCG GCGAACGGGG GTTGCCCTCC
10981 CCGTCATGCA AGACCCCGCT TGCAAATTCC GCTGCGGCAG ATGCGCCCCC CTCTCAGCA GCGGCAAGAG
11041 TTTTCCCAGA TGCATCCGGT GCTGCGGCAG ATGCGCCCCC CTCTCAGCA GCGGCAAGAG
11101 CAAGAGCAGC GGCAGACATG CAGGGCACCC TCCCCTCTC CTACCGCGTC AGGAGGGGCG
11161 ACATCCGCGG TTGACGCGGC AGCAGATGGT GATTACGAAC CCCCAGCGCG CCGGGCCCGG
11221 CACTACCTGG ACTTGAGGGA GGGCGAGGGC CTGGCGCGGC TAGGAGCGCC CTCTCTGAG
11281 CCGTACCCAA GGGTGCAGCT GAAGCGTGAT ACGCGTGAGG CGTACGTGCC GCGGCAGAAC
11341 CTGTTTCGCG ACCGCGAGGG AGAGGAGCCC GAGGAGATGC GGGATCGAAA GTTCCACGCA
11401 GGGCGCGAGC TGCGGCATGG CCTGAATCGC GAGCGGTTGC TGCGCGAGGA GGACTTTGAG
11461 CCGGACGCGC GAACCGGGAT TAGTCCCGCG CGCGCACACG TGGCGGCGCG CGACCTGGTA
11521 ACCGCATACG AGCAGACGGT GAACCAGGAG ATTAACCTTC AAAAAAGCTT TAACAACCAC
11581 GTGCGTACGC TTGTGGCGCG CGAGGAGGTG GCTATAGGAC TGATGCATCT GTGGGACTTT
11641 GTAAGCGCGC TGGAGCAAAA CCCAAATAGC AAGCCGCTCA TGGCGCAGCT GTTCCCTATA
11701 GTGACGACCA GCAGGGACAA CGAGGCATTC AGGGATGCGC TGCTAAACAT AGTAGAGCCC
11761 GAGGGCCGCT GGCTGCTCGA TTTGATAAAC ATCCTGCAGA GCATAGTGGT GCAGGAGCGC
11821 AGCTTGAGCC TGGCTGACAA GGTGGCCGCC ATCAACTATT CCATGCTTAG CCTGGGCAAG
11881 TTTTACGCCC GCAAGATATA CCATACCCCT TACGTTCCCA TAGACAAGGA GGTAAGATC
11941 GAGGGGTTCT ACATGCGCAT GGCGCTGAAG GTGCTTACCT TGAGCGACGA CCTGGGCGTT
12001 TATCGCAACG AGCGCATCCA CAAGGCCGTG AGCGTGAGCC GCGGCGCGCA GCTCAGCGAC
12061 CGCGAGCTGA TGACAGCCT GCAAAGGCC CTGGCTGGCA CCGGCGAGCG CGATAGAGAG
12121 GCCGAGTCCT ACTTTGACGC GGGCGCTGAC CTGCGCTGGG CCCCAGGCCG ACGCGCCCTG
12181 GAGGCGAGTG GGGCCGGACC TGGGCTGGCG GTGGCACCCG CGCGCGCTGG CAACGTCCGC
12241 GCGGTGGAGG AATATGACGA GGACGATGAG TACGAGCCAG AGGACGGCGA GTACTAAGCG
12301 GTGATGTTTC TGATCAGATG ATGCAAGACG CAACGGACCC GCGGCTGCGG GCGGCGCTGC
12361 AGAGCCAGCC GTCCGGCCTT AACTCCACGG ACGACTGGCG CCAGGTCAAT GACCGCATCA
12421 TGTCGCTGAC TGCGCGCAAT CCTGACGCGT TCCGGCAGCA GCGCAGGCC AACCGGCTCT
12481 CCGCAATTCT GGAAGCGGTG GTCCCGGCGC GCGCAAACCC CACGCACGAG AAGGTGCTGG
12541 CGATCGTAAA CCGCTGGGCC GAAAACAGGG CCATCCGGCC CGACGAGGCC GGCCTGGTCT
12601 ACGACGCGCT GCTTCAGCGC GTGGCTCGTT ACAACAGCGG CAACGTGCAG ACCAACCTGG
12661 ACCGGCTGGT GGGGGATGTG CGCGAGGCCG TGGCGCAGCG TGAGCGCGCG CAGCAGCAGG
12721 GCAACCTGGG CTCCATGGTT GCACTAAACG CCTTCCTGAG TACACAGCCC GCCAACGTGC
12781 CGCGGGGACA GGAGGACTAC ACCAACTTTG TGAGCGCACT GCGGCTAATG GTGACTGAGA
12841 CACCGCAAAG TGAGGTGTAC CAGTCTGGGC CAGACTATTT TTTCCAGACC AGTAGACAAG
12901 GCCTGCAGAC CGTAAACCTG AGCCAGCGCT TCAAAAACCT GCAGGGGCTG TGGGGGGTGC

```

FIGURE 21
(SHEET 4)

```

12961 GGGCTCCAC AGGCGACCGC GCGACCGTGT CTAGCTTGCT GACGCCCAAC TCGCGCCTGT
13021 TGCTGCTGCT AATAGCGCCC TTCACGGACA GTGGCAGCGT GTCCCGGGAC ACATACCTAG
13081 GTCAGTGTGCT GACACTGTAC CGCGAGGCCA TAGGTCAGGC GCATGTGGAC GAGCATACTT
13141 TCCAGGAGAT TACAAGTGTC AGCCGCGCGC TGGGGCAGGA GGACACGGGC AGCCTGGAGG
13201 CAACCTAAA CTACCTGCTG ACCAACCGGC GGCAGAAGAT CCCCTCGTTG CACAGTTTAA
13261 ACAGCGAGGA GGAGCGCATT TTGCGCTAGT TGCAGCAGAG CGTGAGCCTT AACCTGATGC
13321 GCGACGGGGT AACGCCCAGC GTGGCGCTGG ACATGACCGC GCGCAACATG GAACCGGGCA
13381 TGTATGCCTC AAACCGGCCG TTTATCAACC GCCTAATGGA CTACTTGCACT CGCGCGGCCG
13441 CCGTGAACCC CGAGTATTTC ACCAATGCCA TCTTGAACCC GCACTGGCTA CCGCCCCCTG
13501 GTTTCTACAC CGGGGGATTC GAGGTGCCCG AGGGTAACGA TGGATTCTCT TGGGACGACA
13561 TAGACGACAG CGTGTTTTCC CCGCAACCGC AGACCTGCTT AGAGTTGCAA CAGCGCGAGC
13621 AGGCAGAGGC GGCGCTGCGA AAGGAAAGCT TCCGCAGGCC AAGCAGCTTG TCCGATCTAG
13681 GCGCTGCGGC CCCGCGGTCA GATGCTAGTA GCCCATTTCG AAGCTTGATA GGGTCTCTTA
13741 CCAGCAGCTG CACCACCGC CCGCGCTGCG TGGGCGAGGA GGAGTACCTA AACAACCTCGC
13801 TGCTGACGCC GCAGCGCGAA AAAAACCTGC CTCCGGCATT TCCCAACAAC GGGATAGAGA
13861 GCCTAGTGGA CAAGATGAGT AGATGGAAGA CGTACGCGCA GGAGCACAGG GACGTGCCAG
13921 GCGCGCGCCC GCCCACCCTG CGTCAAAGGC ACGACCGTCA CCGGGGTCTG GTGTGGGAGG
13981 ACGATGACTC GGCAGACGAC AGCAGCGTCC TGGATTGGGG AGGGAGTGGC AACCCTTTTG
14041 CGCACCTTCG CCCCAGGCTG GGGAGAATGT TTTAAAAAAA AAAAAGCATG ATGCAAAATA
14101 AAAAATCAC CAAGGCCATG GCACCGAGTG TTGGTTTTCT TGTATTCCCC TTAGTATGCG
14161 GCGCGCGGCG ATGTATGAGG AAGGTCCTCC TCCCTCCTAC GAGAGTGTGG TGAGCGCGGC
14221 GCCAGTGGCG GCGGCGCTGG GTTCTCCCTT CGATGCTCCC CTGGACCCGC CGTTTGTGCC
14281 TCCGCGGTAC CTGCGGCCTA CCGGGGGGAG AAACAGCATC CGTTACTCTG AGTTGGCACC
14341 CCTATTGAC ACCACCCCTG TGTACCTGGT GGACAACAAG TCAACGGATG TGGCATCCCT
14401 GAACCTACAG AACGACCACA GCAACTTTCT GACCACGGTC ATTCAAAACA ATGACTACAG
14461 CCCGGGGGAG GCAAGCACAC AGACCATCAA TCTTGACGAC CGGTGCACT GGGGCGGCGA
14521 CCTGAAAACC ATCCTGCATA CCAACATGCC AAATGTGAAC GAGTTCATGT TTACCAATAA
14581 GTTTAAGGCG CGGGTGATGG TGTGCGGCTT GCCTACTAAG GACAATCAGG TGGAGCTGAA
14641 ATACGAGTGG GTGGAGTTCA CGCTGCCCCG GGGCAACTAC TCCGAGACCA TGACCATAGA
14701 CCTTATGAAC AACGCGATCG TGGAGCACTA CTTGAAAGTG GGACAGACA ACGGGGTTCT
14761 GGAAAGCGAC ATCGGGGTAA AGTTTGACAC CCGCAACTTC AGACTGGGGT TTGACCCCTG
14821 CACTGGTCTT GTCATGCCTG GGGTATATAC AAACGAAGCC TTCCATCCAG ACATCATTTT
14881 GCTGCCAGGA TGCGGGGTGG ACTTCACCCA CAGCCGCTG AGCAACTTGT TGGGCGTCCG
14941 CAAGCGCAA CCCTTCCAGG AAGGCTTTAG GATCACCTAC GATGATCTGG AGGGTGGTAA
15001 CATTCCCGCA CTGTTGGATG TGGACGCCTA CCAGGCGAGC TTGAAAGATG ACACCGAACA
15061 GGGCGGGGGT GGCGCAGGCG GCAGCAACAG CAGTGGCAGC GGCGCGGAAG AGAACTCCAA
15121 CGCGGCAGCC GCGGCAATGC AGCCGGTGGG GGACATGAAC GATCATGCCA TTCGCGGCGA
15181 CACCTTTGCC ACACGGGCTG AGGAGAAGCG CGCTGAGGCC GAAGCAGCGG CCGAAGCTGC
15241 CGCCCCCGCT GCGCAACCCG AGGTCGAGAA GCCTCAGAAG AAACCGGTGA TCAAACCCCT
15301 GACAGAGGAC AGCAAGAAAC GCAGTTACAA CCTAATAAGC AATGACAGCA CCTTACCCA
15361 GTACCGCAGC TGGTACCTTG CATACAACTA CCGCGACCCT CAGACCGGAA TCCGCTCATG
15421 GACCCTGCTT TGCACTCCTG ACGTAACCTG CCGCTCGGAG CAGGTCTACT GGTGCTTGCC
15481 AGACATGATG CAAGACCCCG TGACCTTCCG CTCCACGCGC CAGATCAGCA ACTTCCGGT
15541 GGTGGGCGCC GAGCTGTTGC CCGTGCACTC CAAGAGCTTC TACAACGACC AGGCCGTCTA
15601 CTCCCAACTC ATCCGCCAGT TTACCTCTCT GACCCACGTG TTCAATCGCT TTCCCGAGAA
15661 CCAGATTTTG GCGCGCCCGC CAGCCCCCAG CATCACCACC GTCAGTGAAA ACGTTCCTGC
15721 TCTCACAGAT CACGGGACGC TACCGCTGCG CAACAGCATC GGAGGAGTCC AGCGAGTGAC
15781 CATTACTGAC GCCAGACGCC GCACCTGCCC CTACGTTTAC AAGGCCCTGG GCATAGTCTC
15841 GCGCGCGCTC CTATCGAGCC GCACCTTTTG AGCAAGCATG TCCATCCTTA TATCGCCAG
15901 CAATAACACA GGCTGGGGCC TGCGCTTCCC AAGCAAGATG TTTGGCGGGG CCAAGAAGCG
15961 CTCCGACCAA CACCCAGTGC GCGTGCGCGG GCACTACCGC GCGCCCTGGG GCGCGCACAA
16021 ACGCGGCCCG ACTGGGCGCA CCACCGTCGA TGACGCCATC GACGCGGTGG TGGAGGAGGC
16081 GCGCAACTAC ACGCCACGC CGCCACAGT GTCCACAGTG GACGCGGCCA TTCAGACCGT
16141 GGTGCGCGGA GCCCGGCGCT ATGCTAAAT GAAGAGACGG CCGAGGCGCG TAGCACGTCG
16201 CCACCGCCGC CGACCCGGCA CTGCCGCCA ACGCGCGCG GCGGCCCTGC TTAACCGCGC
16261 ACGTCGACCG GGCCGACGGG CGGCCATGCG GGCCGCTCGA AGGCTGGCCG CCGGTATTGT
16321 CACTGTGCCC CCCAGGTCCA GGCGACGAGC GGCCGCCGCA GCAGCCGCGG CCATTAGTGC

```

```

16381 TATGACTCAG GGTGCGAGGG GCAACGTGTA TTGGGTGCGC GACTCGGTTA GCGGCCTGCG
16441 CGTGCCCGTG CGCACCCGCC CCCCGCGCAA CTAGATTGCA AGAAAAAACT ACTTAGACTC
16501 GTACTGTTGT ATGTATCCAG CGGCGGCGGC GCGCAACGAA GCTATGTCCA AGCGCAAAAT
16561 CAAAGAAGAG ATGCTCCAGG TCATCGCGCC GGAGATCTAT GGCCCCCGA AGAAGGAAGA
16621 GCAGGATTAC AAGCCCCGAA AGCTAAAGCG GGTCAAAAAG AAAAAAGAAAG ATGATGATGA
16681 TGAACCTTGAC GACGAGGTGG AACTGCTGCA CGTACCOCG CCCAGGCGAC GGGTACAGTG
16741 GAAAGGTGCA CGCGTAAAC GTGTTTTGCG ACCCGGCACC ACCGTAGTCT TTACGCCCCG
16801 TGAGCGCTCC ACCCGCACCT ACAAGCGCGT GTATGATGAG GTGTACGCG ACAGGACCT
16861 GCTTGAGCAG GCCAACGAGC GCCTCGGGGA GTTTGCCTAC GGAAAGCGGC ATAAGGACAT
16921 GCTGGCGTTG CCGCTGGACG AGGGCAACCC AACACCTAGC CTAAAGCCCG TAACACTGCA
16981 GCAGGTGCTG CCCGCGCTTG CACCGTCCGA AGAAAAGCGC GGCCTAAAGC GCGAGTCTGG
17041 TGACTTGGCA CCCACCGTGC AGCTGATGGT ACCCAAGCGC CAGCGACTGG AAGATGTCTT
17101 GGAAAAAATG ACCGTGGAAC CTGGGCTGGA GCGCGAGGTC CGCGTGCGGC CAATCAAGCA
17161 GGTGGCGCCG GGACTGGGCG TGCAGACCGT GGACGTTTCA ATACCCACTA CCAGTAGCAC
17221 CAGTATTGCC ACCGCCACAG AGGGCATGGA GACACAAACG TCCCCGGTTG CCTCAGCGGT
17281 GCGCGATGCC GCGGTGCAGG CCGTGCCTGC GGCCGCGTCC AAGACCTCTA CGGAGGTGCA
17341 AACGGACCCG TGGATGTTTC GCGTTTCAGC CCCCCGCGC CCGCGCGGTT CGAGGAAGTA
17401 CCGCGCCGCC AGCGCGCTAC TGCCCGAATA TGCCCTACAT CCTTCCATTG CGCCTACCCC
17461 CGGCTATCGT GGCTACACCT ACCGCCCCAG AAGACGAGCA ACTACCCGAC GCCGAACAC
17521 CACTGGAACC CGCCGCCGCC GTCGCCGTCG CCAGCCCGTG CTGGCCCCGA TTTCCGTGCG
17581 CAGGGTGGCT CGCGAAGGAG GCAGGACCCT GGTGCTGCCA ACAGCGCGCT ACCACCCAG
17641 CATCGTTTAA AAGCCGGTCT TTGTGGTTCT TGCAGATATG GCCCTCACCT GCCGCCCTCG
17701 TTTCCCGGTG CCGGGATTCC GAGGAAGAAT GCACCGTAGG AGGGGCATGG CCGGCCACGG
17761 CCTGACGGGC GGCATGCGTC GTGCGCACCA CCGCGCGCGG CCGCGCTGCG ACCGTGCGAT
17821 GCGCGGCGGT ATCTGCCCC TCCTTATTCC ACTGATCGCC GCGGCGATTG GCGCCGTGCC
17881 CGGAATTGCA TCCGTGGCCT TGCAGGCGCA GAGACACTGA TTAAAAACAA GTTGCATGTG
17941 GAAAAATCAA AATAAAAAGT CTGGACTCTC ACGCTCGCTT GGTCTGTAA CTATTTTGTA
18001 GAATGGAAGA CATCAACTTT GCGTCTCTGG CCCC GCGACA CGGCTCGCGC CCGTTCATGG
18061 GAAACTGGCA AGATATCGGC ACCAGCAATA TGAGCGGTGG CGCCTTCAGC TGGGGCTCGC
18121 TGTGGAGCGG CATTAAAAAT TTCGGTTCCA CCGTTAAGAA CTATGGCAGC AAGGCCTGGA
18181 ACAGCAGCAC AGGCCAGATG CTGAGGGATA AGTTGAAAGA GCAAAATTTT CAACAAAAGG
18241 TGGTAGATGG CCTGGCCTCT GGCATTAGCG GGGTGGTGGG CCTGGCCAAC CAGGCAGTGC
18301 AAAATAAGAT TAACAGTAAG CTTGATCCCC GCCCTCCCGT AGAGGAGCCT CCACCGGCCG
18361 TGGAGACAGT GTCTCCAGAG GGGCGTGGCG AAAAGCGTCC GCGCCCCGAC AGGGAAGAAA
18421 CTCTGGTGAC GCAAAATAGAC GAGCCTCCCT CGTACGAGGA GGCATAAAG CAAGGCCTGC
18481 CCACCACCCG TCCCATCGCG CCCATGGCTA CCGGAGTGCT GGGCCAGCAC ACACCCGTAA
18541 CGCTGGACCT GCCTCCCCC GCCGACACCA AGCAGAAACC TGTGCTGCCA GGCCGACCG
18601 CCGTTGTTGT AACCCGTCTT AGCCGCGCGT CCCTGCGCCG CGCCGCCAGC GGTCCGCGAT
18661 CGTTGCGGCC CGTAGCCAGT GGCAACTGGC AAAGCACACT GAACAGCATC GTGGGTCTGG
18721 GGGTGCAATC CCTGAAGCGC CGACGATGCT TCTGAATAGC TAACGTGTCG TATGTGTGTC
18781 ATGTATGCGT CCATGTCGCC GCCAGAGGAG CTGCTGAGCC GCGCGCGGCC CGCTTTCCAA
18841 GATGGCTACC CCTTCGATGA TGCCGCGATG GTCTTACATG CACATCTCGG GCCAGGACGC
18901 CTCGGAGTAC CTGAGCCCCG GGCTGGTGCA GTTTGCCCCG GCCACCGAGA CGTACTTCAG
18961 CCTGAATAAC AAGTTTAGAA ACCCCACGGT GGCGCCTACG CACGACGTGA CCACAGACCG
19021 GTCCCAGCGT TTGACGCTGC GGTTCATCCC TGTGGACCGT GAGGATACTG CGTACTCGTA
19081 CAAGGCGCGG TTCACCCTAG CTGTGGGTGA TAACCGTGTG CTGGACATGG CTTCCACGTA
19141 CTTTGACATC CGCGGCGTGC TGGACAGGGG CCCTACTTTT AAGCCCTACT CTGGCACTGC
19201 CTACAACGCC CTGGCTCCCA AGGGTGCCCC AAATCCTTGC GAATGGGATG AAGCTGCTAC
19261 TGCTCTTGAA ATAAACCTAG AAGAAGAGGA CGATGACAAC GAAGACGAAG TAGACGAGCA
19321 AGCTGAGCAG CAAAAAATC ACGTATTTGG GCAGGCGCCT TATTCTGGTA TAAATATTAC
19381 AAAGGAGGGT ATTCAAATAG GTGTCGAAGG TCAAAACACT AAATATGCCG ATAAACATT
19441 TCAACCTGAA CCTCAAATAG GAGAATCTCA GTGGTACGAA ACTGAAATTA ATCATGCAGC
19501 TGGGAGAGTC CTTAAAAAGA CTACCCCAAT GAAACCATGT TACGGTTTCAT ATGCAAAACC
19561 CACAAATGAA AATGGAGGGC AAGGCATTCT TGTAAGCAA CAAAATGGAA AGCTAGAAAG
19621 TCAAGTGGA ATGCAATTTT TCTCAACTAC TGAGGCGACC GCAGGCAATG GTGATAACTT
19681 GACTCCTAAA GTGGTATTGT ACAGTGAAGA TGTAGATATA GAAACCCAG ACACTCATAT
19741 TTCTTACATG CCCACTATTA AGGAAGGTAA CTCACGAGAA CTAATGGGCC AACAACTAT

```



```

19801 GCCCAACAGG CCTAATTACA TTGCTTTTAG GGACAATTTT ATTGGTCTAA TGTATTACAA
19861 CAGCACGGGT AATATGGGTG TTCTGGCGGG CCAAGCATCG CAGTTGAATG CTGTGTAGTA
19921 TTTGCAAGAC AGAAACACAG AGCTTTCATA CCAGCTTTTG CTTGATTCCA TTGGTGATAG
19981 AACCAGGTAC TTTTCTATGT GGAATCAGGC TGTGACAGC TATGATCCAG ATGTTAGAAT
20041 TATTGAAAAT CATGGAACGT AAGATGAACT TCCAAATTAC TGCTTTCCAC TGGGAGGTGT
20101 GATTAATACA GAGACTCTTA CCAAGGTAAA ACCTAAAACA GGTCAGGAAA ATGGATGGGA
20161 AAAAGATGCT ACAGAATTTT CAGATAAAAA TGAAATAAGA GTTGGAATAA ATTTTGCCAT
20221 GGAAATCAAT CTAAATGCCA ACCTGTGGAG AAATTTCTTG TACTCCAACA TAGCGCTGTA
20281 TTTGCCCCGAC AAGCTAAAGT ACAGTCCTTC CAACGTAAAA ATTTCTGATA ACCCAAACAC
20341 CTACGACTAC ATGAACAAGC GAGTGGTGGC TCCCGGGTTA GTGGACTGCT ACATTAACCT
20401 TGGAGCACGC TGGTCCCTTG ACTATATGGA CAACGTCAAC CCATTTAACC ACCACCGCAA
20461 TGCTGGCCTG CGCTACCGCT CAATGTTGCT GGGCAATGGT CGCTATGTGC CCTTCCACAT
20521 CCAGGTGCCT CAGAAGTTCT TTGCCATTAA AAACCTCCTT CTCCTGCCGG GCTCATAAC
20581 CTACGAGTGG AACTTCAGGA AGGATGTTAA CATGGTTCTG CAGAGCTCCC TAGGAAATGA
20641 CCTAAGGGTT GACGGAGCCA GCATTAAAGT TGATAGCATT TGCTTTACG CCACCTTCTT
20701 CCCCATGGCC CACAACACCG CCTCCACGCT TGAGGCCATG CTTAGAAAACG ACACCAACGA
20761 CCAGTCCTTT AACGACTATC TCTCCGCGCG CAACATGCTC TACCCTATAC CCGCCAACGC
20821 TACCAACGTG CCCATATCCA TCCCCTCCCG CAACTGGGCG GCTTTCCGCG GCTGGGCCTT
20881 CACGCGCCTT AAGACTAAGG AAACCCCATC ACTGGGCTCG GGCTACGACC CTTATTACAC
20941 CTACTCTGGC TCTATACCCT ACCTAGATGG AACCTTTTAC CTCAACCACA CTTTAAAGAA
21001 GGTGGCCATT ACCTTTGACT CTTCTGTGAG CTGGCCTGGC AATGACCGCC TGCTTACCCC
21061 CAACGAGTTT GAAATTAAGC GCTCAGTTGA CGGGGAGGGT TACAACGTTG CCCAGTGTA
21121 CATGACCAAA GACTGGTTCC TGGTACAAAT GCTAGCTAAC TACAACATTG GCTACCAGGG
21181 CTTCTATATC CCAGAGAGCT ACAAGGACCG CATGTACTCC TTCTTTAGAA ACTTCCAGCC
21241 CATGAGCCGT CAGGTGGTGG ATGATACTAA ATACAAGGAC TACCAACAGG TGGGCATCCT
21301 ACACCAACAC AACAACCTG GATTTGTTGG CTACCTTGCC CCCACCATGC GCGAAGGACA
21361 GGCCTACCCT GCTAACTTCC CCTATCCGCT TATAGGCAAG ACCGCAGTTG ACAGCATTAC
21421 CCAGAAAAAG TTTCTTTGCG ATCGCACCTT TTGGCGCATC CCATTCTCCA GTAACTTTAT
21481 GTCCATGGGC GCACTCACAG ACCTGGGCCA AAACCTTCTC TACGCCAACT CCGCCACGCG
21541 GCTAGACATG ACTTTTGAGG TGGATCCCAT GGACGAGCCC ACCCTTCTTT ATGTTTGTGTT
21601 TGAAGTCTTT GACGTGGTCC GTGTGCACCG GCCGCACCGC GGCGTCATCG AAACCGTGTA
21661 CTGCGCACG CCCTTCTCGG CCGGCAACGC CACAACATAA AGAAGCAAGC AACATCAACA
21721 ACAGCTGCCG CCATGGGCTC CAGTGAGCAG GAACTGAAAG CCATTGTCAA AGATCTTGGT
21781 TGTGGGCCAT ATTTTGTGG CACCTATGAC AAGCGCTTTC CAGGCTTTGT TTCTCCACAC
21841 AAGCTCGCCT GCGCCATAGT CAATACGGCC GGTGCGGAGA CTGGGGGCGT ACACTGGATG
21901 GCCTTTGCCT GGAACCCGCA CTCAAAAACA TGCTACCTCT TTGAGCCCTT TGGCTTTTCT
21961 GACCAGCGAG TCAAGCAGGT TTACCAAGTT GAGTACGAGT CACTCCTGCG CCGTAGCGCC
22021 ATTGCTTCTT CCCCAGCCG CTGTATACG CTGGAAAAGT CCACCCAAAG CGTACAGGGG
22081 CCCAACTCGG CCGCCTGTGG ACTATTCTGC TGCATGTTTC TCCACGCCTT TGCCAACTGG
22141 CCCCAAACCT CCATGGATCA CAACCCACC ATGAACCTTA TTACCGGGGT ACCCAAACCTC
22201 ATGCTCAACA GTCCCCAGGT ACAGCCACC CTGCGTCGCA ACCAGGAACA GCTCTACAGC
22261 TTCCTGGAGC GCCACTCGCC CTACTTCCGC AGCCACAGTG CGCAGATTAG GAGCGCCACT
22321 TCTTTTGTG ACTTGAAAAA CATGTAAAAA TAATGTACTA GAGACACTTT CAATAAAGGC
22381 AAATGCTTTT ATTTGTACAC TCTCGGTGA TTATTACCC CCACCTTGC CGTCTGCGCC
22441 GTTTAAAAAT CAAAGGGGTT CTGCGCGCA TCGCTATGCG CCACTGGCAG GGACACGTTG
22501 CGATACTGGT GTTTAGTGCT CCACTTAAAC TCAGGCACAA CCATCCGCGG CAGCTCGGTG
22561 AAGTTTTTAC TCCACAGGCT GCGCACCATC ACCAACGCGT TTAGCAGGTC GGGCGCGGAT
22621 ATCTTGAAGT CGCAGTTGGG GCCTCCGCCC TCGCGCGCG AGTTGCGATA CACAGGGTTG
22681 CAGCACTGGA ACACTATCAG CGCCGGGTGG TGCACGCTGG CCAGCAGCTT CTTGTGCGAG
22741 ATCAGATCCG CGTCCAGTGC CTCGCGTGG CTCAGGGCGA ACGGAGTCAA CTTTGGTAGC
22801 TGCCTTCCCA AAAAGGGCGC GTGCCAGGC TTTGAGTTGC ACTCGCACCG TAGTGGCATC
22861 AAAAGGTGAC CGTGCCCGGT CTGGGCGTTA GGATACAGCG CCTGCATAAA AGCCTTGATC
22921 TGCTTAAAAG CCACCTGAGC CTTTGCCTCT TCAGAGAAGA ACATGCCGCA AGACTTGCCG
22981 GAAAACGTAT TGGCCGGACA GGCCGCGTCG TGCACGAGC ACCTTGCCTC GGTGTTGGAG
23041 ATCTGCACCA CATTTCCGCC CCACCGGTTT TTCACGATCT TGGCCTTGCT AGACTGCTCC
23101 TTCAGCGCGC GCTGCCGTT TTCGCTCGTC ACATCCATTT CAATCACGTG CTCCTTATTT
23161 ATCATAATGC TTCCGTGTAG ACACTTAAGC TCGCCTTCCA TCTCAGCGCA GCGGTGCAGC

```

29/66

```

23221 CACAACGCGC AGCCCGTGGG CTCGTGATGC TTGTAGGTCA CCTCTGCAAA CGACTGCAGG
23281 TACGCCTGCA GGAATCGCCC CATCATCGTC ACAAAGGTCT TGTTCGTGGT GAAGGTCAGC
23341 TGCAACCCGC GGTGCTCCTC GTTCAGCCAG GTCTTGCCATA GGGCCGCCAG AGCTTCCACT
23401 TGGTCAGGCA GTAGTTTGAA GTTCGCCTTT AGATCGTTAT CCACGTGGTA CTTGTCCATC
23461 AGCGCGCGCG CAGCCTCCAT GCCCTTCTCC CACGCAGACA CGATCGGCAC ACTCAGCGGG
23521 TTCATCACCG TAATTCTACT TTCCGCTTCG CTGGGCTCTT CCTCTTCCTC TTGCGTCCGC
23581 ATACCACGCG CCACTGGGTC GTCTTCATTG AGCCGCCGCA CTGTGCGCTT ACCTCCTTTG
23641 CCATGCTTGA TTAGCACCGG TGGGTTGCTG AAACCCACCA TTTGTAGCGC CACATCTTCT
23701 CTTTCTTCCT CGCTGTCCAC GATTACCTCT GGTGATGGCG GCGCTCGGG CTTGGGAGAA
23761 GGGCGCTTCT TTTTCTTCTT GGGCGCAATG GCCAAATCCG CCGCCGAGGT CGATGGCCCG
23821 GGGCTGGGTG TGCGCGGCAC CAGCGCGTCT TGTGATGAGT CTTCTCTGTC CTCGGACTCG
23881 ATACGCCGCC TCATCCGCTT TTTTGGGGGC GCCCGGGAG GCGGCGGCGA CCGGGACGGG
23941 GACGACACGT CCTCCATGCT TGGGGGACGT CCGCGCCGAC CGCGTCCGCG CTCGGGGGTG
24001 GTTTCGCGCT GCTCCTCTTC CCGACTGGCC ATTTCTTCTT CCTATAGGCA GAAAAAGATC
24061 ATGGAGTCAG TCGAGAAGAA GGACAGCCTA ACCGCCCCCT CTGAGTTCGC CACCACCGCC
24121 TCCACCGATG CCGCCAACGC GCCTACCACC TTCCCGCTCG AGGCACCCCC GCTTGAGGAG
24181 GAGGAAGTGA TTATCGAGCA GGACCCAGGT TTTGTAAGCG AAGACGACGA GGACCGCTCA
24241 GTACCAACAG AGGATAAAAA GCAAGACCAG GACAACGCAG AGGCAAAACGA GGAACAAATC
24301 GGGCGGGGGG ACGAAAAGCA TGGCGACTAC CTAGATGTGG GAGACGACGT GCTGTTGAAG
24361 CATCTGCAGC GCCAGTGCAG CATTATCTGC GACGCGTTGC AAGAGCGCAG CGATGTGCCC
24421 CTCGCCATAG CGGATGTCAG CCTTGCCTAC GAACGCCACC TATTCTCACC GCGCGTACCC
24481 CCCAAACGCC AAGAAAACCG CACATGCGAG CCCAACCCGC GCCTCAACTT CTACCCCGTA
24541 TTTGCCGTGC CAGAGGTGCT TGCCACCTAT CACATCTTTT TCCAAACTG CAAGATACCC
24601 CTATCCTGCC GTGCCAACCG CAGCCGAGCG GACAAGCAGC TGGCCTTGCG GCAGGGCGCT
24661 GTCATACCTG ATATCGCCTC GCTCAACGAA GTGCCAAAAA TCTTTGAGGG TCTTGGACGC
24721 GACGAGAAGC GCGCGGCAAA CGCTCTGCAA CAGGAAAACA GCGAAAATGA AAGTCACTCT
24781 GGAGTGTGGG TGGAATCGA GGGTGACAAC GCGCGCCTAG CCGTACTAAA ACGCAGCATC
24841 GAGGTCACCC ACTTTGCCTA CCCGGCACTT AACCTACCCC CCAAGGTCAAT GAGCACAGTC
24901 ATGAGTGAGC TGATCGTGCG CCGTGCGCAG CCCCTGGAGA GGGATGCAAA TTTGCAAGAA
24961 CAAACAGAGG AGGGCCTACC CGCAGTTGGC GACGAGCAGC TAGCGCGCTG GCTTCAAACG
25021 CGCGAGCCTG CCGACTTGGA GGAGCGACGC AAATAATGA TGGCCGCAGT GCTCGTTACC
25081 GTGGAGCTTG AGTGATGCA GCGGTTCTTT GCTGACCCCG AGATGCAGCG CAAGCTAGAG
25141 GAAACATTGC ACTACACCTT TCGACAGGGC TACGTACGCC AGGCCTGCAA GATCTCCAAC
25201 GTGGAGCTCT GCAACCTGGT CTCCTACCTT GGAATTTTGC ACGAAAACCG CCTTGGGCAA
25261 AACGTGCTTC ATTCCACGCT CAAGGGCGAG GCGCGCCGCG ACTACGTCCG CGACTGCGTT
25321 TACTTATTTT TATGCTACAC CTGGCAGACG GCCATGGGCG TTTGGCAGCA GTGCTTGGAG
25381 GAGTGCAACC TCAAGGAGCT GCAGAAATG CTAAAGCAAA ACTTGAAGGA CCTATGGACG
25441 GCCTTCAACG AGCGCTCCGT GGCCGCGCAC CTGGCGGACA TCATTTTCCC CGAACGCCTG
25501 CTTAAAACCC TGCAACAGGG TCTGCCAGAC TTCACCAGTC AAAGCATGTT GCAGAACTTT
25561 AGGAACTTTA TCCTAGAGCG CTCAGGAATC TTGCCCGCCA CCTGCTGTGC ACTTCCTAGC
25621 GACTTTGTGC CCATTAAGTA CCGCGAATGC CCTCCGCCGC TTTGGGGCCA CTGCTACCTT
25681 CTGCAGCTAG CCAACTACCT TGCCTACCAC TCTGACATAA TGGAAGACGT GAGCGGTGAC
25741 GGTCTACTGG AGTGTCACTG TCGCTGCAAC CTATGCACCC CGCACCGCTC CTTGGTTTGC
25801 AATTGCGCAG TGCTTAACGA AAGTCAAATT ATCGGTACCT TTGAGCTGCA GGTGCCCTCG
25861 CCTGACGAAA AGTCCGCGGC TCCGGGGTTG AAACCTACTC CGGGGCTGTG GACGTGGGCT
25921 TACCTTCGCA AATTTGTACC TGAGGACTAC CACGCCCACG AGATTAGGTT CTACGAAGAC
25981 CAATCCCGCC CGCCAAATGC GGAGCTTACC GCCTGCGTCA TTACCCAGGG CCACATTCTT
26041 GGCCAATTGC AAGCCATCAA CAAAGCCCGC CAAGAGTTTC TGCTACGAAA GGGACGGGGG
26101 GTTTACTTGG ACCCCAGTCC CCGCGAGGAG CTCAACCCAA TCCCCCGCC GCCCGAGCCC
26161 TATCAGCAGC AGCCGCGGGC CCTTGCTTCC CAGGATGGCA CCCAAAAAGA AGCTGCAGCT
26221 GCCGCGGCCA CCCACGGACG AGGAGGAATA CTGGGACAGT CAGGCAGAGG AGGTTTGGGA
26281 CGAGGAGGAG GAGGACATGA TGGAAGACTG GGAGAGCCTA GACGAGGAAG CTTCCGAGGT
26341 CGAAGAGGTG TCAGACGAAA CACCGTCACC CTCGGTCGCA TTCCCTCGC CGGCGCCCCA
26401 GAAATCGGCA ACCGGTTCCA GCATGGCTAC AACCTCCGCT CCTCAGGCGC CGCCGGCACC
26461 GCGCGTTGCG CGACCCAACC GTAGATGGGA CACCACTGGA ACCAGGGCCG GTAAGTCCAA
26521 GCAGCGCCG CCGTTAGCCC AAGAGCAACA ACAGCGCCAA GGCTACCGCT CATGGCGCGG
26581 GCACAGAAGC GCCATAGTTG CTTCCTTGCA AGACTGTGGG GGCAACATCT CTTTCGCCCG

```

```

26641 CCGCTTTCTT CTCTACCATC ACGGCGTGGC CTTCCCCCGT AACATCCTGC ATTACTACCG
26701 TCATCTCTAC AGCCCATACT GCACCGGCGG CAGCGGCAGC GGCAGCAACA GCAGCGGCCA
26761 CACAGAAGCA AAGGCGACCG GATAGCAAGA CTCTGACAAA GCCCAAGAAA TCCACAGCGG
26821 CGGCAGCAGC AGGAGGAGGA GCGCTGCGTC TGGCGCCCAA CGAACCCGTA TCGACCCGCG
26881 AGCTTAGAAA CAGGATTTTT CCCACTCTGT ATGCTATATT TCAACAGAGC AGGGGCCAAG
26941 AACAAAGAGCT GAAAATAAAA AACAGGTCCT TGCGATCCCT CACCCGCAGC TGCCTGTATC
27001 ACAAAAGCGA AGATCAGCTT CGGCGCACGC TGGAAGACGC GGAGGCTCTC TTCAGTAAAT
27061 ACTGCGCGCT GACTCTTAAG GACTAGTTTC GCGCCCTTTC TCAAATTTAA GCGCGAAAAC
27121 TACGTCATCT CCAGCGGCCA CACCCGGCGC CAGCACCTGT CGTCAGCGCC ATTATGAGCA
27181 AGGAAATTCC CACGCCCTAC ATGTGGAGTT ACCAGCCACA AATGGGACTT GCGGCTGGAG
27241 CTGCCCAAGA CTACTCAACC CGAATAAACT ACATGAGCGC GGGACCCAC ATGATATCCC
27301 GGGTCAACGG AATCCGCGCC CACCGAAACC GAATTCTCTT GGAACAGGCG GCTATTACCA
27361 CCACACCTCG TAATAACCTT AATCCCCGTA GTTGGCCCGC TGCCCTGGTG TACCAGGAAA
27421 GTCCCGCTCC CACCACTGTG GTACTTCCCA GAGACGCCCA GGCCGAAGTT CAGATGACTA
27481 ACTCAGGGGC GCAGCTTGCG GGCGGCTTTC GTCACAGGGT GCGGTCGCCC GGGCAGGGTA
27541 TAACTCACCT GACAATCAGA GGGCGAGGTA TTCAGCTCAA CGACGAGTCG GTGAGCTCCT
27601 CGCTTGGTCT CCGTCCGGAC GGGACATTTT AGATCGGCGG CGCCGGCCGT CCTTCATTCA
27661 CGCCTCGTCA GGCAATCCTA ACTCTGCAGA CCTCGTCCTC TGAGCCGCGC TCTGGAGGCA
27721 TTGGAACCTCT GCAATTTATT GAGGAGTTTG TGCCATCGGT CTACTTTAAC CCCTTCTCGG
27781 GACCTCCCGG CCACTATCCG GATCAATTTA TTCCTAACTT TGACGCGGTA AAGGACTCGG
27841 CGGACGGCTA CGACTGAATG TTAAGTGGAG AGGCAGAGCA ACTGCGCCTG AAACACCTGG
27901 TCCACTGTCT CCGCCACAAG TGCTTTGCCC GCGACTCCGG TGAGTTTTCG TACTTTGAAT
27961 TGCCCGAGGA TCATATCGAG GGCCCGGCGC ACGGCGTCCG GCTTACCGCC CAGGGAGAGC
28021 TTGCCCGTAG CCTGATTCGG GAGTTTACCC AGCGCCCCCT GCTAGTTGAG CGGGACAGGG
28081 GACCTCTGTG TCTCACTGTG ATTTGCAACT GTCCTAACCT TGGATTACAT CAAGATCTTT
28141 GTTGCCATCT CTGTGCTGAG TATAATAAAT ACAGAAATTA AAATATACTG GGGCTCCTAT
28201 CGCCATCCTG TAAACGCCAC CGTCTTCACC CGCCCAAGCA AACCAAGGCG AACCTTACCT
28261 GGTACTTTTA ACATCTCTCC CTCTGTGATT TACAACAGTT TCAACCCAGA CGGAGTGAGT
28321 CTACGAGAGA ACCTCTCCGA GCTCAGCTAC TCCATCAGAA AAAACACCAC CCTCCTTACC
28381 TGCCGGGAAC GTACGAGTGC GTCACCGGCC GCTGCACCAC ACCTACCGCC TGACCGTAAA
28441 CCAGACTTTT TCCGGACAGA CCTCAATAAC TCTGTTTACC AGAACAGGAG GTGAGCTTAG
28501 AAAACCCTTA GGGTATTAGG CCAAGAGCGC AGCTACTGTG GGGTTTATGA ACAATTCAAG
28561 CAACTCTACG GGCTATTCTA ATTCAGGTTT CTCTAGAATC GGGGTGTTGGG TTATTCTCTG
28621 TCTTGTGATT CTCTTTATTC TTATACTAAC GCTTCTCTGC CTAAGGCTCG CCGCCTGCTG
28681 TGTGCACATT TGCATTTATT GTCAGCTTTT TAAACGCTGG GGTGCGCCACC CAAGATGATT
28741 AGGTACATAA TCCTAGGTTT ACTCACCTT GCGTCAGCCC ACGGTACCAC CCAAAAGGTG
28801 GATTTTAAAG AGCCAGCCTG TAATGTTACA TTCGCAGCTG AAGCTAATGA GTGCACCACT
28861 CTTATAAAAT GCACCACAGA ACATGAAAAG CTGCTTATTC GCCACAAAAA CAAAATTGGC
28921 AAGTATGCTG TTTATGCTAT TTGGCAGCCA GGTGACACTA CAGAGTATAA TGTTACAGTT
28981 TTCCAGGGTA AAAGTCATAA AACTTTTATG TATACTTTTC CATTTTATGA AATGTGCGAC
29041 ATTACCATGT ACATGAGCAA ACAGTATAAG TTGTGGCCCC CACAAAATG TGTGGAAAAC
29101 ACTGGCATT TCTGCTGCAC TGCTATGCTA ATTACAGTGC TCGCTTTGGT CTGTACCCTA
29161 CTCTATATTA AATACAAAAG CAGACGCAGC TTTATTGAGG AAAAGAAAAA GCCTTAAATT
29221 ACTAAGTTAC AAAGCTAATG TCACCACTAA CTGCTTTACT CGCTGCTTGC AAAACAATT
29281 CAAAAAGTTA GCATTATAAT TAGAATAGGA TTAAACCCCC CCGGTCATT CTGTCTCAAT
29341 ACCATTCCCC TGAACAATTG ACTCTATGTG GGATATGCTC CAGCGCTACA ACCTTGAAGT
29401 CAGGCTTCCT GGATGTCAGC ATCTGACTTT GGCCAGCACC TGTCCCGCGG ATTTGTTCCA
29461 GTCCAACCTAC AGCGACCCAC CCTAACAGAG ATGACCAACA CAACCAACGC GGCCGCCGCT
29521 ACCGACTTCA CATCTACCAC AAATACACCC CAAGTTTCTG CCTTTGTCAA TAACTGGGAT
29581 AACTTGGGCA TGTGGTGGTT CTCCATAGCG CTTATGTTTG TATGCCTTAT TATTATGTGG
29641 CTCATCTGCT GCCTAAAGCG CAAACGCGCC CGACCACCCA TCTATAGTCC CATCATGTG
29701 CTACACCCAA ACAATGATGG AATCCATAGA TTGGACGGAC TGAAACACAT GTTCTTTTCT
29761 CTTACAGTAT GATTAAATGA GACATGATTC CTCGAGTTT TATATTACTG ACCCTTGTGT
29821 CGCTTTTTTG TGCGTGCTCC ACATTGGCTG CGGTTTCTCA CATCGAAGTA GACTGCATTC
29881 CAGCCTTCAC AGTCTATTTG CTTTACGGAT TTGTCACCC CTGCTCATC TGCAGCCTCA
29941 TCACTGTGGT CATCGCCTTT ATCCAGTGCA TTGACTGGGT CTGTGTGCGC TTTGCATATC
30001 TCAGACACCA TCCCCAGTAC AGGGACAGGA CTATAGCTGA GCTTCTTAGA ATTCTTTAAT

```

```

30061 TATGAAATTT ACTGTGACTT TTCTGCTGAT TATTTGCACC CTATCTGCGT TTTGTTCCCC
30121 GACCTCCAAG CCTCAAAGAC ATATATCATG CAGATTCACT CGTATATGGA ATATTCCAAG
30181 TTGCTACAAT GAAAAAAGCG ATCTTTCCGA AGCCTGGTTA TATGCAATCA TCTCTGTTAT
30241 GGTGTTCTGC AGTACCATCT TAGCCCTAGC TATATATCCC TACCTTGACA TTGGCTGGAA
30301 ACGAATAGAT GCCATGAACC ACCCAACTTT CCCCgcgccc GCTATGCTTC CACTGCAACA
30361 AGTTGTTGCC GCGGCTTTG TCCCAGCCAA TCAGCCTCGC CCCACTTCTC CCACCCCCAC
30421 TGAAATCAGC TACTTTAATC TAACAGGAGG AGATGACTGA CACCCTAGAT CTAGAAATGG
30481 ACGGAATTAT TACAGAGCAG CGCCTGCTAG AAAGACGCAG GGCAGCGGCC GAGCAACAGC
30541 GCATGAATCA AGAGCTCCAA GACATGGTTA ACTTGCACCA GTGCAAAAGG GGTATCTTTT
30601 GTCTGGTAAA GCAGGCCAAA GTCACCTACG ACAGTAATAC CACCGGACAC CGCCTTAGCT
30661 ACAAGTTGCC AACCAAGCGT CAGAAATTGG TGGTCATGGT GGGAGAAAAG CCCATTACCA
30721 TAACTCAGCA CTCGGTAGAA ACCGAAGGCT GCATTCACTC ACCTTGTCAG GGACCTGAGG
30781 ATCTCTGCAC CCTTATTAAG ACCCTGTGCG GTCTCAAAGA TCTTATTCCC TTAACTAAT
30841 AAAAAAAAT AATAAAGCAT CACTTACTTA AAATCAGTTA GCAAATTTCT GTCCAGTTTA
30901 TTCAGCAGCA CCTCCTTGCC CTCCTCCAG CTCTGGTATT GCAGCTTCCT CCTGGCTGCA
30961 AACTTTCTCC ACAATCTAAA TGGAAATGTA GTTTCCTCCT GTTCTGTGCC ATCCGACCCC
31021 ACTATCTTCA TGTGTTGCA GATGAAGCGC GCAAGACCGT CTGAAGATAC TTCAACCCC
31081 GTGTATCCAT ATGACACGGA AACCGTCTCT CCAACTGTGC CTTTTCTTAC TCCTCCCTTT
31141 GTATCCCCCA ATGGGTTTCA AGAGAGTCCC CCTGGGGTAC TCTCTTTGCG CCTATCCGAA
31201 CCTCTAGTTA CCTCCAATGG CATGCTTGCG CTCAAAATGG GCAACGGCCT CTCTCTGGAC
31261 GAGGCCCGCA ACCTTACCTC CCAAAATGTA ACCACTGTGA GCCCACCTCT CAAAAAACC
31321 AAGTCAAACA TAAACCTGGA AATATCTGCA CCCCTCACAG TTACCTCAGA AGCCCTAAGT
31381 GTGGCTGCCG CCGCACCTCT AATGGTCGCG GGCAACACAC TCACCATGCA ATCAGAGCCC
31441 CCGCTAACCG TGCACGACTC CAAACTTAGC ATTGCCACCC AAGGACCCCT CACAGTGTCA
31501 GAAGGAAAGC TAGCCCTGCA AACATCAGGC CCCCTCACCA CCACCGATAG CAGTACCCTT
31561 ACTATCACTG CCTCACCCCT TCTAACTACT GCCACTGGTA GCTTGGGCAT TGACTTGAAA
31621 GAGCCCATT TATACACAAA TGGAAACTA GGAATAAGT ACGGGGCTCC TTTGCATGTA
31681 ACAGACGACC TAAACACTTT GACCGTAGCA ACTGGTCCAG GTGTGACTAT TAATAACT
31741 TCCTTGCAAA CTAAAGTTAC TGGAGCCTTG GGTTTTGATT CACAAGGCAA TATGCACTT
31801 AATGTAGCAG GAGGACTAAG GATTGATTCT CAAAACAGAC GCCTTATACT TGATGTTAGT
31861 TATCCGTTTG ATGCTCAAAA CCAACTAAAT CTAAGACTAG GACAGGGCCC TCTTTTATA
31921 AACTCAGCCC ACAACTTGGA TATTAAGTAC AACAAAGGCC TTTACTTGT TACAGCTTCA
31981 AACAATTCCA AAAAGCTTGA GGTAAACCTA AGCACTGCCA AGGGGTGAT GTTTGACGCT
32041 ACAGCCATAG CCATTATGTC AGGAGATGGG CTTGAATTTG GTTCACCTAA TGCACCAAAC
32101 ACAAATCCCC TCAAAACAAA AATTGGCCAT GGCCTAGAAT TTGATTCAAA CAAGGCTATG
32161 GTTCTTAAC TAGGAACTGG CTTAGTTT GACAGCACAG GTGCCATTAC AGTAGGAAC
32221 AAAAAATAAG ATAAGCTAAC TTTGTGGACC ACACCAGCTC CATCTCTAA CTGTAGACTA
32281 AATGCAGAGA AAGATGCTAA ACTCACTTTG GTCTTAACAA AATGTGGCAG TCAAATACTT
32341 GCTACAGTTT CAGTTTTGGC TGTTAAAGGC AGTTTGGCTC CAATATCTGG AACAGTTCAA
32401 AGTGCTCATC TTATTATAAG ATTTGACGAA AATGGAGTGC TACTAAACAA TTCCTCCTG
32461 GACCCAGAAT ATTGGAACCT TAGAAATGGA GATCTTACTG AAGGCACAGC CTATACAAAC
32521 GCTGTTGGAT TTATGCCTAA CCTATCAGCT TATCCAAAAT CTCACGGTAA AACTGCCAAA
32581 AGTAACATTG TCAGTCAAGT TTACTTAAAC GGAGACAAAA CTAAACCTGT AACACTAACC
32641 ATTACACTAA ACGGTACACA GGAAACAGGA GACACAACCT CAAGTGCATA CTCTATGTCA
32701 TTTTCATGGG ACTGGTCTGG CCACAACCTAC ATTAATGAAA TATTTGCCAC ATCCTCTTAC
32761 ACTTTTTTCAT ACATTGCCCA AGAATAAAGA ATCGTTTGTG TTATGTTTCA ACGTGTTTAT
32821 TTTTCAATTG CAGAAAATT CAAGTCATT TTCATTCACT AGTATAGCCC CACCACCACA
32881 TAGCTTATAC AGATCACCGT ACCTTAATCA AACTCACAGA ACCCTAGTAT TCAACCTGCC
32941 ACCTCCCTCC CAACACACAG AGTACACAGT CCTTTCTCCC CGGCTGGCCT TAAAAAGCAT
33001 CATATCATGG GTAACAGACA TATTCCTTAGG TGTTATATTC CACACGGTTT CCTGTGAGC
33061 CAAACGCTCA TCAGTGATAT TAATAAACTC CCCGGGCAGC TCACTTAAGT TCATGTCGCT
33121 GTCCAGCTGC TGAGCCACAG GCTGCTGTCC AACTTGCGGT TGCTTAACGG GCGGCGAAGG
33181 AGAAGTCCAC GCCTACATGG GGGTAGAGTC ATAATCGTGC ATCAGGATAG GCGGCTGGTG
33241 CTGCAGCAGC GCGCGAATAA ACTGCTGCCG CCGCCGCTCC GTCCTGCAGG AATAACAAT
33301 GGCAGTGGTC TCCTCAGCGA TGATTCTGCAC CGCCCGCAGC ATAAGGCGCC TTGTCTCCG
33361 GGCACAGCAG CGCACCTGA TCTCACTTAA ATCAGCACAG TAACTGCAGC ACAGCACCAC
33421 AATATTGTTT AAAATCCAC AGTGCAAGGC GCTGTATCCA AAGCTCATGG CGGGACCAC

```

33481 AGAACCACG TGGCCATCAT ACCACAAGCG CAGGTAGATT AAGTGGCGAC CCCTCATAAA
33541 CACGCTGGAC ATAAACATTA CCTCTTTTGG CATGTTGTAA TTCACCACCT CCCGGTACCA
33601 TATAAACCTC TGATTAAACA TGGCGCCATC CACCACCATC CTAAACCAGC TGGCCAAAAC
33661 CTGCCCCGCG GCTATACACT GCAGGGAACC GGGACTGGAA CAATGACAGT GGAGAGCCCA
33721 GGAATCGTAA CCATGGATCA TCATGCTCGT CATGATATCA ATGTTGGCAC AACACAGGCA
33781 CACGTGCATA CACTTCTCTA GGATTACAAG CTCCTCCCGC GTTAGAACCA TATCCCAGGG
33841 AACAACCCAT TCCTGAATCA GCGTAAATCC CACACTGCAG GGAAGACCTC GCACGTAACT
33901 CACGTTGTGC ATTGTCAAAG TGTTACATTC GGGCAGCAGC GGATGATCCT CCAGTATGGT
33961 AGCGCGGGTT TCTGTCTCAA AAGGAGGTAG ACGATCCCTA CTGTACGGAG TGCGCCGAGA
34021 CAACCGAGAT CGTGTGGTTC GTAGTGTCTAT GCCAAATGGA ACGCCGAGC TAGTCATATT
34081 TCCTGAAGCA AAACCAGGTG CGGGCGTGAC AAACAGATCT GCGTCTCCGG TCTCGCCGCT
34141 TAGATCGCTC TGTGTAGTAG TTGTAGTATA TCCACTCTCT CAAAGCATCC AGGCGCCCCC
34201 TGGCTTCGGG TTCTATGTAA ACTCCTTCAT GCGCCGCTGC CCTGATAACA TCCACCACCG
34261 CAGAATAAGC CACACCACG CAACTACAC ATTCGTTCTG CGAGTCACAC ACGGGAGGAG
34321 CGGGAAGAGC TGAAGAACC ATGTTTTTTT TTTTATTCCA AAAGATTATC CAAAACCTCA
34381 AAATGAAGAT CTATTAAGTG AACGCGTCC CCTCCGGTGG CGTGGTCAAA CTCTACAGCC
34441 AAAGAACAGA TAATGGCATT TGTAAGATGT TGCACAATGG CTTCCAAAAG GCAAACGGCC
34501 CTCACGTCCA AGTGGACGTA AAGGCTAAAC CCTTCAGGGT GAATCTCCTC TATAACATT
34561 CCAGCACCTT CAACCATGCC CAAATAATTC TCATCTCGCC ACCTTCTCAA TATATCTCTA
34621 AGCAAATCCC GAATATTAAG TCCGGCCATT GTAAAAATCT GCTCCAGAGC GCCCTCCACC
34681 TTCAGCCTCA AGCAGCGAAT CATGATTGCA AAAATTCAGG TTCCTCACAG ACCTGTATAA
34741 GATTCAAAAG CGGAACATTA AAAAAATAC CGCGATCCCG TAGGTCCCTT CGCAGGGCCA
34801 GCTGAACATA ATCGTGCAGG TCTGCACGGA CCAGCGCGGC CACTTCCCG CCAGGAACCT
34861 TGACAAAAGA ACCCACACTG ATTATGACAC GCATACTCGG AGCTATGCTA ACCAGCGTAG
34921 CCCCAGTGTA AGCTTTGTTG CATGGGCGGC GATATAAAAT GCAAGGTGCT GCTCAAAAAA
34981 TCAGGCAAAG CCTCGCGCAA AAAAGAAAGC ACATCGTAGT CATGCTCATG CAGATAAAGG
35041 CAGGTAAGCT CCGGAACCAC CACAGAAAAA GACACCATT TTTCTCTCAA CATGTCTGCG
35101 GGTTCCTGCA TAAACACAAA ATAAAAATAC AAAAAACAT TTAAACATTA GAAGCCTGTC
35161 TTACAACAGG AAAAACACCC CTTATAAGCA TAAGACGGAC TACGGCCATG CCGGCGTGAC
35221 CGTAAAAAAA CTGGTCACCG TGATTAAAAA GCACCACCGA CAGCTCCTCG GTCATGTCCG
35281 GAGTCATAAT GTAAGACTCG GTAAACACAT CAGGTTGATT CATCGGTCAG TGCTAAAAAG
35341 CGACCGAAAT AGCCCGGGG AATACATACC CGCAGGCGTA GAGACAACAT TACAGCCCCC
35401 ATAGGAGGTA TAACAAAATT AATAGGAGAG AAAACACAT AAACACCTGA AAAACCTCC
35461 TGCCTAGGCA AAATAGCACC CTCCCGCTCC AGAACACAT ACAGCGCTTC ACAGCGGCAG
35521 CCTAACAGTC AGCCTTACCA GTAAAAAGA AAACCTATTA AAAAAACACC ACTCGACACG
35581 GCACAGCTC AATCAGTCAC AGTGTAAGAA AGGGCCAAGT GCAGAGCGAG TATATATAGG
35641 ACTAAAAAAT GACGTAACGG TTAAAGTCCA CAAAAACAC CCAGAAAACC GCACGCGAAC
35701 CTACGCCAG AAACGAAAGC CAAAAACCC ACAACTTCCT CAAATCGTCA CTTCCGTTTT
35761 CCCACGTTAC GTAACCTCCC ATTTTAAGAA AACTACAATT CCAACACAT ACAAGTTACT
35821 CCGCCCTAAA ACCTACGTCA CCCGCCCGT TCCCACGCC CGCGCCAGT CACAACTCC
35881 ACCCCCTCAT TATCATATTG GCTTCAATCC AAAATAAGGT ATATTATTGA TGATG

//

FIGURE 21
(SHEET 11)

LOCUS KD1 33592 bp DNA SYN 28-APR-1999
DEFINITION KD1
ACCESSION KD1
KEYWORDS .
SOURCE Unknown.
ORGANISM Unknown
Unclassified.
REFERENCE 1 (bases 1 to 33592)
AUTHORS Self
JOURNAL Unpublished.
FEATURES Location/Qualifiers
CDS 1..33592
/gene="KD1"
/product="KD1"
BASE COUNT 7744 a 9470 c 9285 g 7093 t
ORIGIN
1 CATCATCAAT AATATACCTT ATTTTGGATT GAAGCCAATA TGATAATGAG GGGGTGGAGT
61 TTGTGACGTG GCGCGGGGCG TGGGAACGGG GCGGGTGACG TAGTAGTGTG GCGGAAGTGT
121 GATGTTGCAA GTGTGGCGGA ACACATGTAA GCGACGATG TGGCAAAAGT GACGTTTTTG
181 GTGTGCGCGG GTGTACACAG GAAGTGACAA TTTTCGCGCG GTTTTAGGCG GATGTTGTAG
241 TAAATTTGGG CGTAACCGAG TAAGATTTGG CCATTTTCGC GGGAAAACCTG AATAAGAGGA
301 AGTGAATCT GAATAATTTT GTGTTACTCA TAGCGCGTAA TATTTGTCTA GGGCCGCGGG
361 GACTTTGACC GTTTACGTGG AGACTCGCCC AGGTGTTTTT CTCAGGTGTT TTCCGCGTTC
421 CGGGTCAAAG TTGGCGTTTT ATTATTATAG TCAGCTGACG TGTAAGTGTAT TTATACCCGG
481 TGAGTTCCTC AAGAGGCCAC TCTTGAGTGC CAGCGAGTAG AGTTTTCTCC TCCGAGCCGC
541 TCCGACACCG GGAAGTGAATA TGAGACATGA GGTACTGGCT GATAATCTTC CACCTCCTAG
601 CCATTTTGAA CCACCTACCC TTCACGAAT GTATGATTTA GACGTGACGG CCCCCGAAGA
661 TCCCAACGAG GAGGCGGTTT CGCAGATTTT TCCCGACTCT GTAATGTTGG CGGTGCAGGA
721 AGGGATTGAC TTACTCACTT TTCCGCCGGC GCCCGGTTCT CCGGAGCCGC CTCACCTTTC
781 CCGGCAGCCC GAGCAGCCGG AGCAGAGAGC CTTGGGTCCG GTTGGCCACG AGGCTGGCTT
841 TCCACCCAGT GACGACGAGG ATGAAGAGGG TGAGGAGTTT GTGTTAGATT ATGTGGAGCA
901 CCGCGGGCAC GGTGTCAGGT CTGTGCATTA TCACCGGAGG AATACGGGGG ACCCAGATAT
961 TATGTGTTCC CTTTGCTATA TGAGGACCTG TGGCATGTTT GTCTACAGTA AGTGAATAAT
1021 ATGGGCAGTG GGTGATAGAG TGGTGGGTTT GGTGTGGTAA TTTTTTTTTT AATTTTTTACA
1081 GTTTTGTGGT TTAAAGAATT TTGTATTGTG ATTTTTTTAA AAGGTCTGTG GTCTGAACCT
1141 GAGCCTGAGC CCGAGCCAGA ACCGGAGCCT GCAAGACCTA CCCGCCGTCC TAAAATGGCG
1201 CCTGCTATCC TGAGACGCCC GACATCACCT GTGTCTAGAG AATGCAATAG TAGTACGGAT
1261 AGCTGTGACT CCGGTCCTTC TAACACACCT CCTGAGATAC ACCCGGTGGT CCCGCTGTGC
1321 CCCATTAAAC CAGTTGCCGT GAGAGTTGGT GGGCGTCGCC AGGCTGTGGA ATGTATCGAG
1381 GACTTGCTTA ACGAGCCTGG GCAACCTTTG GACTTGAGCT GTAAACGCCC CAGGCCATAA
1441 GGTGTAAACC TGTGATTGCG TGTGTGGTTA ACGCCTTTGT TTGCTGAATG AGTTGATGTA
1501 AGTTTAATAA AGGGTGAGAT AATGTTTAAAC TTGCATGGCG TGTTAAATGG GCGGGGGCTT
1561 AAAGGGTATA TAATGCGCCG TGGGCTAATC TTGGTTACAT CTGACCTCAT GGAGGCTTGG
1621 GAGTGTGTTG AAGATTTTTT TGCTGTGCGT AACTTGCTGG AACAGAGCTC TAACAGTACC
1681 TCTTGGTTTT GGAGGTTTCT GTGGGCTCA TCCAGGCAA AGTTAGTCTG CAGAATTAAG
1741 GAGGATTACA AGTGGGAATT TGAAGAGCTT TTGAAATCCT GTGGTGAGCT GTTTGATTCT
1801 TTGAATCTGG GTCACCAGGC GCTTTTCCAA GAGAAGGTCA TCAAGACTTT GGATTTTTTC
1861 ACACCGGGG GCGCTGCGGC TGCTGTGCTT TTTTGTAGTT TTATAAAGGA TAAATGGAGC
1921 GAAGAAACCC ATCTGAGCGG GGGGTACCTG CTGGATTTTC TGGCCATGCA TCTGTGAGGA
1981 GCGGTTGTGA GACACAAGAA TCGCCTGCTA CTGTGTCTT CCGTCCGCCC GCGGATAATA
2041 CCGACGGAGG AGCAGCAGCA GCAGCAGGAG GAAGCCAGGC GCGGCGGCA GGAGCAGAGC
2101 CCATGGAACC CGAGAGCCGG CCTGGACCCT CGGGAATGAA TGTGTACAG GTGGCTGAAC
2161 TGTATCCAGA ACTGAGACGC ATTTTGACAA TTACAGAGGA TGGGCGAGGG CTAAAGGGGG
2221 TAAAGAGGGA GCGGGGGGCT TGTGAGGCTA CAGAGGAGGC TAGGAATCTA GCTTTTAGCT
2281 TAATGACCAG ACACCGTCTT GAGTGTATTA CTTTCAACA GATCAAGGAT AATTGCGCTA
2341 ATGAGCTTGA TCTGCTGGCG CAGAAGTATT CCATAGAGCA GCTGACCACT TACTGGCTGC
2401 AGCCAGGGGA TGATTTTGAG GAGGCTATTA GGTATATGCA AAAGGTGGCA CTTAGGCCAG

kdl

FIGURE 22
(SHEET 1)

34/66

```

2461 ATTGCAAGTA CAAGATCAGC AAACCTTGTA ATATCAGGAA TTGTTGCTAC ATTTCTGGGA
2521 ACGGGGCCGA GGTGGAGATA GATACGGAGG ATAGGGTGGC CTTTAGATGT AGCATGATAA
2581 ATATGTGGCC GGGGTGCTT GGCATGGACG GGGTGGTTAT TATGAATGTA AGGTTTACTG
2641 GCCCAATTT TAGCGGTACG GTTTTCCTGG CCAATACCAA CCTTATCCTA CACGGTGTAA
2701 GCTTCTATGG GTTTAACAAT ACCTGTGTGG AAGCCTGGAC CGATGTAAGG GTTCGGGGCT
2761 GTGCCTTTTA CTGCTGCTGG AAGGGGGTGG TGTGTCGCCC CAAAAGCAGG GCTTCAATTA
2821 AGAAATGCCT CTTTGAAAGG TGTACCTTGG GTATCCTGTC TGAGGGTAAC TCCAGGGTGC
2881 GCCACAATGT GGCCTCCGAC TGTGGTTGCT TCATGCTAGT GAAAAGCGTG GCTGTGATTA
2941 AGCATAACAT GGTATGTGGC AACTGCGAGG ACAGGGCCTC TCAGATGCTG ACCTGCTCGG
3001 ACGGCAACTG TCACCTGCTG AAGACCATTG ACGTAGCCAG CCACTCTCGC AAGGCCGTGG
3061 CAGTGTTTGA GCATAACATA CTGACCCGCT GTTCCTTGCA TTTGGGTAAC AGGAGGGGGG
3121 TGTTCTTACC TTACCAATGC AATTTGAGTC AACTAAGAT ATTGCTTGAG CCCGAGAGCA
3181 TGTCCAAGGT GAACCTGAAC GGGGTGTTTG ACATGACCAT GAAGATCTGG AAGGTGCTGA
3241 GGTACGATGA GACCCGCACC AGGTGCAGAC CCTGCGAGTG TGCGGGTAAA CATATTAGGA
3301 ACCAGCCTGT GATGCTGGAT GTGACCGAGG AGCTGAGGCC CGATCACTTG GTGCTGGCCT
3361 GCACCCGCGC TGAGTTTGGC TCTAGCGATG AAGATACAGA TTGAGGTACT GAAATGTGTG
3421 GGCGTGGCTT AAGGGTGGGA AAGAATATAT AAGGTGGGGG TCTTATGTAG TTTTGTATCT
3481 GTTTTGCAGC AGCCGCGGCC GCCATGAGCA CCAACTCGTT TGATGGAAGC ATTGTGAGCT
3541 CATATTTGAC AACCGCATG CCCCCATGGG CCGGGGTGCG TCAGAATGTG ATGGGCTCCA
3601 GCATTGATGG TCGCCCCGTC CTGCCCCGAA ACTCTACTAC CTGACCTAC GAGACCGTGT
3661 CTGGAACGCC GTTGGAGACT GCAGCCTCCG CCGCCGCTTC AGCCGCTGCA GCCACCGCCC
3721 GCGGGATTGT GACTGACTTT GCTTTCCTGA GCCCGCTTGC AAGCAGTGCA GCTTCCCGTT
3781 CATCCGCCCG CGATGACAAG TTGACGGCTC TTTTGGCACA ATTGGATTCT TTGACCCGGG
3841 AACTTAATGT CGTTTCTCAG CAGCTGTTGG ATCTGCGCCA GCAGGTTTCT GCCCTGAAGG
3901 CTTCCTCCCC TCCCAATGCG GTTTAAAACA TAAATAAAAA ACCAGACTCT GTTTGATTAT
3961 GGATCAAGCA AGTGTCTTGC TGTCTTTATT TAGGGGTTTT GCGCGCGCGG TAGGCCCGGG
4021 ACCAGCGGTC TCGGTCGTTG AGGGTCCTGT GTATTTTTTC CAGGACGTGG TAAAGGTGAC
4081 TCTGGATGTT CAGATACATG GGCATAAGCC CGTCTCTGGG GTGAGGGTAG CACCACTGCA
4141 GAGCTTCATG CTGCGGGGTG GTGTTGTAGA TGATCCAGTC GTAGCAGGAG CGCTGGGCGT
4201 GGTGCCTAAA AATGTCTTTC AGTAGCAAGC TGATTGCCAG GGGCAGGCCC TTGGTGTAAG
4261 TGTTTACAAA GCGGTTAAGC TGGATGGGT GCATACGTGG GGATATGAGA TGCATCTTGG
4321 ACTGTATTTT TAGGTTGGCT ATGTTCCAG CCATATCCCT CCGGGGATTG ATGTTGTGCA
4381 GAACCACCAG CACAGTGTAT CCGGTGCACT TGGGAAATTT GTCATGTAGC TTAGAAGGAA
4441 ATGCGTGGA GAACTTGGAG ACGCCCTTGT GACCTCCAAG ATTTTCCATG CATTCGTCCA
4501 TAATGATGGC AATGGGCCCC CCGCGGCGG CCTGGGCGAA GATATTTCTG GGATCACTAA
4561 CGTCATAGTT GTGTTCCAGG ATGAGATCGT CATAGGCCAT TTTTACAAAG CGCGGGCGGA
4621 GGGTGCCAGA CTGCGGTATA ATGGTTCCAT CCGGCCAGG GCGTAGTTA CCTCAGAGA
4681 TTTGCATTTT CCACGCTTTG AGTTCAGATG GGGGGATCAT GTCTACCTGC GGGGCGATGA
4741 AGAAAACGGT TTCCGGGGTA GGGGAGATCA GCTGGGAAGA AAGCAGGTTT CTGAGCAGCT
4801 GCGACTTACC GCAGCCGGTG GGCCCGTAAA TCACACCTAT TACCGGGTGC AACTGGTAGT
4861 TAAGAGAGCT GCAGCTGCCG TCATCCCTGA GCAGGGGGGC CACTTCGTTA AGCATGTCCC
4921 TGACTCGCAT GTTTTCCCTG ACCAAATCCG CCAGAAGGCG CTCGCGCGCC AGCGATAGCA
4981 GTTCTTGCAA GGAAGCAAAG TTTTCAACG GTTTGAGACC GTCCGCCGTA GGCATGCTTT
5041 TGAGCGTTTG ACCAAGCAGT TCCAGGCGGT CCCACAGCTC GGTCACCTGC TCTACGGCAT
5101 CTCGATCCAG CATATCTCCT CGTTTCGCGG GTTGGGGCGG CTTTCGCTGT ACGGCAGTAG
5161 TCGGTGCTCG TCCAGACGGG CCAGGGTCAT GTCTTTCCAC GGGCGCAGGG TCCTCGTCAG
5221 CGTAGTCTGG GTCACGGTGA AGGGGTGCGC TCCGGGCTGC GCGCTGCCA GGGTGCGCTT
5281 GAGGCTGGTC CTGCTGGTGC TGAAGCGCTG CCGGTCTTCG CCCTGCGCGT CCGCCAGGTA
5341 GCATTTGACC ATGGTGTCAT AGTCCAGCCC CTCGCGGGCG TGGCCCTTGG CGCGCAGCTT
5401 GCCCTTGGAG GAGGCGCCGC ACGAGGGGCA GTGCAGACTT TTGAGGGCGT AGAGCTTGGG
5461 CGCGAGAAAT ACCGATTCCG GGGAGTAGGC ATCCGCGCCG CAGGCCCCGC AGACGGTCTC
5521 GCATTTCCAG AGCCAGGTGA GCTCTGGCCG TTCGGGGTCA AAAACCAGGT TTCCCCCATG
5581 CTTTTTGATG CGTTTCTTAC CTCTGGTTTC CATGAGCCGG TGTCCACGCT CGGTGACGAA
5641 AAGGCTGTCC GTGTCCCCGT ATACAGACTT GAGAGGCCTG TCCTCGAGCG GTGTTCCGCG
5701 GTCTCTCTCG TATAGAAACT CGGACCACTC TGAGACAAAG GCTCGCGTCC AGGCCAGCAC
5761 GAAGGAGGCT AAGTGGGAGG GGTAGCGGTC GTTGTTCACT AGGGGGTCCA CTCGCTCCAG
5821 GGTGTGAAGA CACATGTCGC CCTCTTCGGC ATCAAGGAAG GTGATTGGTT TGTAGGTGTA

```

5881 GGCCACGTGA CCGGGTGTTC CTGAAGGGGG GCTATAAAAG GGGGTGGGGG CGCGTTCGTC
5941 CTCACCTCTCT TCCGCATCGC TGTCTGCGAG GGCCAGCTGT TGGGGTGAGT ACTCCCTCTG
6001 AAAAGCGGGC ATGACTTCTG CGCTAAGATT GTCAGTTTCC AAAAACGAGG AGGATTTGAT
6061 ATTCACCTGG CCCGCGGTGA TGCCTTTGAG GGTGGCCGCA TCCATCTGGT CAGAAAAGAC
6121 AATCTTTTTTGT TTGTCAAGCT TGGTGGCAAA CGACCCGTAG AGGGCGTTGG ACAGCAACTT
6181 GGCATGGAG CGCAGGGTTT GGTTTTTGTG GCGATCGCGC CGCTCCTTGG CCGCGATGTT
6241 TAGCTGCACG TATTGCGCGC CAACGCACCG CCATTCGGGA AAGACGGTGG TGCCTCGTC
6301 GGGCACCAGG TGCACGCGCC AACCGCGGTT GTGCAGGGTG ACAAGGTCAA CGCTGGTGGC
6361 TACCTCTCCG CGTAGGCGCT CGTTGGTCCA GCAGAGGCGG CCGCCCTTGC GCGAGCAGAA
6421 TGGCGGTAGG GGGTCTAGCT GCGTCTCGTC CGGGGGGTCT GCGTCCACGG TAAAGACCCC
6481 GGGCAGCAGG CGCGCGTCGA AGTAGTCTAT CTTGCATCCT TGCAAGTCTA GCGCCTGCTG
6541 CCATGCGCGG GCGGCAAGCG CGCGCTCGTA TGGGTTGAGT GGGGGACCCC ATGGCATGGG
6601 GTGGGTGAGC GCGGAGGCGT ACATGCCGCA AATGTCGTAA ACGTAGAGGG GCTCTCTGAG
6661 TATTCCAAGA TATGTAGGGT AGCATCTTCC ACCGCGGATG CTGGCGCGCA CGTAATCGTA
6721 TAGTTCGTGC GAGGGAGCGA GGAGGTCGGG ACCGAGGTTG CTACGGGCGG GCTGCTCTGC
6781 TCGGAAGACT ATCTGCCTGA AGATGGCATG TGAGTTGGAT GATATGGTTG GACGCTGGAA
6841 GACGTTGAAG CTGGCGTCTG TGAGACCTAC CGCGTCACGC ACGAAGGAGG CGTAGGAGTC
6901 GCGCAGCTTG TTGACCAGCT CGGCGGTGAC CTGCACGCTT AGGGCGCAGT AGTCCAGGGT
6961 TTCCTTGATG ATGTCATACT TATCCTGTCC CTTTTTTTTT CACAGCTCGC GGTTGAGGAC
7021 AAACCTCTTCG CGGTCTTTCC AGTACTCTTG GATCGGAAAC CCGTCGGCCT CCGAACGGTA
7081 AGAGCCTAGC ATGTAGAACT GGTTCAGCGC CTGGTAGGCG CAGCATCCCT TTTCTACGGG
7141 TAGCGCGTAT GCCTGCGCGG CCTTCCGGAG CGAGGTGTGG GTGAGCGCAA AGGTGTCCCT
7201 GACCATGACT TTGAGGTACT GGTATTTGAA GTCAGTGTG TCGCATCCGC CTTGCTCCCA
7261 GAGCAAAAAG TCCGTGCGCT TTTTGGAAAC CGGATTTGGC AGGGCGAAGG TGACATCGTT
7321 GAAGAGTATC TTTCCCGCGC GAGGCATAAA GTTGCGTGTG ATGCGGAAGG GTCCCGGCAC
7381 CTCGGAACGG TTGTTAATTA CCTGGGCGGC GAGCACGATC TCGTCAAAGC CGTTGATGTT
7441 GTGGCCACCA ATGTAAAGTT CCAAGAAGCG CGGGATGCCC TTGATGGAAG GCAATTTTTT
7501 AAGTTCCTCG TAGGTGAGCT CTTCAGGGGA GCTGAGCCCG TGCTCTGAAA GGGCCAGTC
7561 TGCAAGATGA GGGTTGGAAG CGACGAATGA GCTCCACAGG TCACGGGCCA TTAGCATTTG
7621 CAGGTGGTCG CGAAAGGTCC TAAACTGGCG ACCTATGGCC ATTTTTTCTG GGGTGATGCA
7681 GTAGAAGGTA AGCGGGTCTT GTTCCCAGCG GTCCCATCCA AGGTTCGCGG CTAGGTCTCG
7741 CGCGGCAGTC ACTAGAGGCT CATCTCCGCC GAACCTCATG ACCAGCATGA AGGGCACGAG
7801 CTGCTTCCCA AAGGCCCCCA TCCAAGTATA GGTCTCTACA TCGTAGGTGA CAAAGAGACG
7861 CTCGGTGCGA GGATGCGAGC CGATCGGGAA GAACTGGATC TCCCGCCACC AATTGGAGGA
7921 GTGGCTATTG ATGTGGTGAA AGTAGAAGTC CCTGCGACGG GCCGAACACT CGTGCTGGCT
7981 TTTGTAAAAA CGTGCGCAGT ACTGGCAGCG GTGCACGGGC TGTACATCCT GCACGAGGTT
8041 GACCTGACGA CCGCGCACAA GGAAGCAGAG TGGGAATTTG AGCCCCTCGC CTGGCGGGTT
8101 TGGCTGGTGG TCTTCTACTT CGGCTGCTTG TCCTTGACCG TCTGGCTGCT CGAGGGGAGT
8161 TACGGTGGAT CGGACCACCA CGCCGCGCGA GCCCAAAGTC CAGATGTCCG CGCGCGGCGG
8221 TCGGAGCTTG ATGACAACAT CGCGCAGATG GGAGCTGTCC ATGGTCTGGA GCTCCGCGG
8281 CGTCAGGTCA GCGGGGAGCT CTTGCAAGTT TACCTCGCAT AGACGGGTCA GGGCGCGGGC
8341 TAGATCCAGG TGATACCTAA TTTCCAGGGG CTGGTTGGTG GCGGCGTCTGA TGGCTTGCAA
8401 GAGGCCGCAT CCCCGCGGCG CGACTACGGT ACCGCGCGGC GGGCGGTGGG CCGCGGGGGT
8461 GTCCTTGATG GATGCATCTA AAAGCGGTGA CGCGGGCGAG CCCCCGAGG TAGGGGGGGG
8521 TCCGGACCCG CCGGGAGAGG GGGCAGGGGC ACGTCGGCGC CGCGCGCGGG CAGGAGCTGG
8581 TGCTGCGCGC GTAGGTTGCT GGCGAACGCG ACGACGCGG GGTGATCTC CTGAATCTGG
8641 CGCCTCTGCG TGAAGACGAC GGGCCCGGTG AGCTTGAGCC TGAAAGAGAG TTCGACAGAA
8701 TCAAATTCGG GTTCGTTGAC GCGGCGCTGG CGCAAAATCT CCTGCACGTC TCCTGAGTTG
8761 TCTTGATAGG CGATCTCGGC CATGAACTGC TCGATCTCTT CCTCCTGGAG ATCTCCGCGT
8821 CCGGCTCGCT CCACGGTGGC GCGAGGTCG TTGGAAATGC GGGCCATGAG CTGCGAGAAG
8881 GCGTTGAGGC CTCCTCGTT CCAGACGCGG CTGTAGACCA CGCCCCCTTC GGCATCGCGG
8941 GCGCGCATGA CCACCTGCGC GAGATTGAGC TCCACGTGCC GGGCGAAGAC GGCAGTATT
9001 CGCAGGCGCT GAAAGAGGTA GTTGAGGGTG GTGGCGGTGT GTTCTGCCAC GAAGAAGTAC
9061 ATAACCCAGC GTCGCAACGT GGATTCGTTG ATATCCCCCA AGGCCTCAAG GCGCTCCATG
9121 GCCTCGTAGA AGTCCACGGC GAAGTTGAAA AACTGGGAGT TGCGCGCCGA CACGGTTAAC
9181 TCCTCTCCA GAAGACGGAT GAGCTCGGCG ACAGTGTGCG GCACCTCGCG CTCAAAGGCT
9241 ACAGGGGCTT CTTCTTCTTC TTCAATCTCC TCTTCATAA GGGCTCCCC TTCTTCTTCT


```

9301 TCTGGCGGCG GTGGGGGAGG GGGGACACGG CGGCGACGAC GGCGCACCGG GAGGCGGTCTG
9361 ACAAAGCGCT CGATCATCTC CCCGCGGCGA CGGCGCATGG TCTCGGTGAC GGCGCGGCCG
9421 TTCTCGCGGG GCGCGAGTTG GAAGACGCCG CCCGTCATGT CCCGGTTATG GGTGGCGGGG
9481 GGGCTGCCAT GCGGCGAGGA TACGGCGCTA ACGATGCATC TCAACAATTG TTGTGTAGGT
9541 ACTCCGCCGC CGAGGGACCT GAGCGAGTCC GCATCGACCG GATCGGAAAA CCTCTCGAGA
9601 AAGGCGTCTA ACCAGTCACA GTCGCAAGGT AGGCTGAGCA CCGTGGCGGG CGGCAGCGGG
9661 CGGCGGTCTG GGTGTGTTCT GCGGAGGTG CTGCTGATGA TGTAATTAAA GTAGGCGGTC
9721 TTGAGACGGC GGATGGTCGA CAGAAGCACC ATGTCCTTGG GTCCGGCCTG CTGAATGCGC
9781 AGGCGGTCTG CCATGCCCCA GGCTTCGTTT TGACATCGGC GCAGGTCTTT GTAGTAGTCT
9841 TGCATGAGCC TTTCTACCGG CACTTCTTCT TCTCCTTCCT CTTGTCTGTC ATCTCTTGCA
9901 TCTATCGCTG CCGCGGCGGC GGAGTTTGCG CGTAGGTGGC GCCCTCTTCC TCCCCTCGCT
9961 GTGACCCCGA AGCCCCCTCAT CGGCTGAAGC AGGGCTAGGT CGGCGACAAC GCGCTCGGCT
10021 AATATGGCCT GCTGCACCTG CGTGAGGGTA GACTGGAAGT CATCCATGTC CACAAAGCGG
10081 TGGTATGCGC CCGTGTGAT GGTGTAAGTG CAGTTGGCCA TAACGGACCA GTTAACGGTC
10141 TGGTGACCCG GCTGCGAGAG CTCGGTGTAC CTGAGACGCG AGTAAGCCCT CGAGTCAAAT
10201 ACGTAGTCGT TGCAAGTCCG CACCAGGTAC TGGTATCCCA CCAAAAAGTG CGGCGGCGGC
10261 TGGCGGTAGA GGGGCCAGCG TAGGGTGGCC GGGGCTCCGG GGGCGAGATC TTCCAACATA
10321 AGGCGTAGAT ATCCGTAGAT GTACCTGGAC ATCCAGGTGA TGCCGGCGGC GGTGGTGGAG
10381 GCGCGCGGAA AGTCGCGGAC GCGGTTCCAG ATGTTGCGCA GCGGCAAAAA GTGCTCCATG
10441 GTCGGGACGC TCTGGCCGGT CAGGCGCGCG CAATCGTTGA CGCTCTAGCG TGCAAAAGGA
10501 GAGCCTGTAA GCGGGCACTC TTCCGTGGTC TGGTGGATAA ATTCGCAAGG GTATCATGGC
10561 GGACGACCGG GGTTCGAGCC CCGTATCCGG CCGTCCGCGG TGATCCATGC GGTACCGCC
10621 CGCGTGTCTG ACCCAGGTGT GCGACGTCAG ACAACGGGGG AGTGCTCCTT TTGGCTTCCT
10681 TCCAGGCGCG GCGGCTGCTG CGTAGCTTTT TTTGGCCACT GCGCGCGCGC AGCGTAAGCG
10741 GTTAGGCTGG AAAGCGAAAG CATTAAAGTG CTCGCTCCCT GTAGCCGGAG GGTATTTTTC
10801 CAAGGGTTGA GTCGCGGGAC CCCCAGTTCC AGTCTCGGAC CGGCCGGACT GCGGCGAACG
10861 GGGGTTTGCC TCCCCGTCT GCAAGACCCC GCTTGCAAAT TCCTCCGAA ACAGGGACGA
10921 GCCCCTTTTT TGCTTTTCCC AGATGCATCC GGTGCTGCGG CAGATGCGCC CCCCTCCTCA
10981 GCAGCGGCAA GAGCAAGAGC AGCGGCAGAC ATGCAGGGCA CCCTCCCTC CTCCTACCGC
11041 GTCAGGAGGG GCGACATCCG CGGTTGACCG GGCAGCAGAT GGTGATTACG AACCCCGCG
11101 GCGCGGGGCC CGGCACTACC TGGACTTGA GAAGGGCGAG GGCCTGGCGC GGCTAGGAGC
11161 GCCCTCTCCT GAGCGGTACC CAAGGGTGCA GCTGAAGCGT GATACGCGTG AGGCGTACGT
11221 GCGCGGCGAG AACCTGTTTC GCGACCGCGA GGGAGAGGAG CCCGAGGAGA TGCGGGATCG
11281 AAAGTTCCAC GCAGGGCGCG AGCTGCGGCA TGGCCTGAAT CGCGAGCGGT TGCTGCGCGA
11341 GGAGGACTTT GAGCCCGACG CGCGAACCAG GATTAGTCCC GCGCGCGCAC ACGTGGCGGC
11401 CGCCGACCTG GTAACCGCAT ACGAGCAGAC GGTGAACCAG GAGATTAAC TTCAAAAAG
11461 CTTTAAACAAC CACGTGCGTA CGCTTGTGGC GCGCGAGGAG GTGGCTATAG GACTGATGCA
11521 TCTGTGGGAC TTGTGAAGCG CGCTGGAGCA AAACCCAAAT AGCAAGCCGC TCATGGCGCA
11581 GCTGTTTCCT ATAGTGCAGC ACAGCAGGGA CAACGAGGCA TTCAGGGATG CGCTGCTAAA
11641 CATAGTAGAG CCCGAGGGCC GCTGGCTGCT CGATTTGATA AACATCCTGC AGAGCATAGT
11701 GGTGCAGGAG CGCAGCTTGA GCCTGGCTGA CAAGGTGGCC GCCATCAACT ATTCCATGCT
11761 TAGCCTGGGC AAGTTTTACG CCCGCAAGAT ATACCATACC CTTTACGTTT CCATAGACAA
11821 GGAGGTAAAG ATCGAGGGGT TCTACATGCG CATGGCGCTG AAGGTGCTTA CCTTGAGCGA
11881 CGACCTGGGC GTTTATCGCA ACGAGCGCAT CCACAAGGCC GTGAGCGTGA GCCGCGGCG
11941 CGAGCTCAGC GACCGCGAGC TGATGCACAG CCTGCAAAGG GCCCTGGCTG GCACGGGCGAG
12001 CGGCGATAGA GAGGCCGAGT CCTACTTTGA CGCGGGCGCT GACCTGCGCT GGGCCCCAAG
12061 CCGACGCGCC CTGGAGGCAG CTGGGGCCGG ACCTGGGCTG GCGGTGGCAC CCGCGCGCGC
12121 TGGCAACGTC GCGGCGGTGG AGGAATATGA CGAGGACGAT GAGTACGAGC CAGAGGACGG
12181 CGAGTACTAA GCGGTGATGT TTCTGATCAG ATGATGCAAG ACGCAACGGA CCCGGCGGTG
12241 CGGGCGGCGC TGCAGAGCCA GCGGTCCGGC CTTAACTCCA CGGACGACTG GCGCCAGGTC
12301 ATGGACCGCA TCATGTCTGCT GACTGCGCGC AATCCTGACG CGTTCCGGCA GCAGCCGCGAG
12361 GCCAACCGGC TCTCCGCAAT TCTGGAAGCG GTGGTCCCGG CGCGCGCAA CCCCACGCAC
12421 GAGAAGGTGC TGGCGATCGT AAACGCGCTG GCCGAAAACA GGGCCATCCG GCCCGACGAG
12481 GCGGCGCTGG TCTACGACGC GCTGCTTCAG CCGTGGGCTC GTTACAACAG CGGCAACGTG
12541 CAGACCAACC TGGACCGGCT GGTGGGGGAT GTGCGCGAGG CCGTGGCGCA GCGTGAGCGC
12601 GCGCAGCAGC AGGGCAACCT GGGCTCCATG GTTGCACTAA ACGCCTTCCT GAGTACACAG
12661 CCCGCCAACG TGCCGCGGGG ACAGGAGGAC TACACCAACT TTGTGAGCGC ACTGCGGCTA

```

```

12721 ATGGTGA CTG AGACACCGCA AAGTGAGGTG TACCAGTCTG GGCCAGACTA TTTTTCAG
12781 ACCAGTAGAC AAGGCCTGCA GACCGTAAAC CTGAGCCAGG CTTTCAAAA CTTCAGGGG
12841 CTGTGGGGG TGCGGGCTCC CACAGGCGAC CGCGCGACCG TGTCTAGCTT GCTGACGCC
12901 AACTCGCGCC TGTGCTGCT GCTAATAGCG CCTTCACGG ACAGTGGCAG CGTGTCCCGG
12961 GACACATACC TAGGTCACTT GCTGACACTG TACCGCGAGG CCATAGGTCA GGCGCATGTG
13021 GACGAGCATA CTTTCCAGGA GATTACAAGT GTCAGCCGCG CGCTGGGGCA GGAGGACACG
13081 GGCAGCCTGG AGGCAACCCT AAACCTACCTG CTGACCAACC GGCGGCAGAA GATCCCCTCG
13141 TTGCACAGTT TAAACAGCGA GGAGGAGCGC ATTTTGCCTG ACCTGCAGCA GAGCGTGAGC
13201 CTTAACCTGA TGCGCGACGG GGTAAACGCC AGCGTGGCGC TGGACATGAC CGCGCGCAAC
13261 ATGGAACCGG GCATGTATGC CTCAAACCGG CCGTTTATCA ACCGCCTAAT GGACTACTTG
13321 CATCGGATAG CCGCCGTGAA CCCCAGTAT TTACCAATG CCACTCTGAA CCCGCACTGG
13381 CTACCGCCCC CTGGTTTCTA CACCGGGGGA TTCGAGGTGC CCGAGGGTAA CGATGGATTC
13441 CTCTGGGACG ACATAGACGA CAGCGTGTTC TCCCCGCAAC CGCAGACCCT GCTAGAGTTG
13501 CAACAGCGCG AGCAGGCAGA GGCGCGCTG CGAAAGGAAA GCTTCCGCGG GCCAAGCAGC
13561 TTGTCGATC TAGGCGCTGC GGCCCCGCGG TCAGATGCTA GTAGCCCAT TCCAAGCTTG
13621 ATAGGGTCTC TTACCAGCAC TCGCACCACC CGCCCCGCGC TGCTGGGCGA GGAGGAGTAC
13681 CTAAACAACT CGCTGTGTCG CCGCAGCGG GAAAAAAACC TGCTCCGGC ATTTCCCAAC
13741 AACGGGATAG AGAGCCTAGT GGACAAGATG AGTAGATGGA AGACGTACGC GCAGGAGCAC
13801 AGGGACGTGC CAGGCCCCGCG CCGCCCCACC CGTCGTCAA GGCACGACCG TCAGCGGGGT
13861 CTGGTGTGGG AGGACGATGA CTCGGCAGAC GACAGCAGCG TCCTGGATTT GGGAGGGAGT
13921 GGCAACCCGT TTGCGCACCT TCGCCCCAGG CTGGGGAGAA TGTTTTAAAA AAAAAAAGC
13981 ATGATGCAAA ATAAAAAACT CACCAAGGCC ATGGCACC GAAGTGGTTT TCTTGATTC
14041 CCCTTAGTAT GCGGCGCGCG GCGATGTATG AGGAAGGTCC TCCTCCCTCC TACGAGAGTG
14101 TGGTGAGCGC GCGGCCAGTG GCGGCGCGCG TGGGTCTCC CTTGATGCT CCCCTGGACC
14161 CGCCGTTGT GCTCCGCGG TACCTGCGGC CTACCGGGG GAGAAACAGC ATCCGTTACT
14221 CTGAGTTGGC ACCCTATTC GACACCACC GTGTGTACCT GGTGGACAAC AAGTCAACGG
14281 ATGTGGCATC CCTGAACTAC CAGAACGACC ACAGCAACT TCTGACCAG GTCAATCAAA
14341 ACAATGACTA CAGCCCGGGG GAGGCAAGCA CACAGACCAT CAATCTTGAC GACCGTGCGC
14401 ACTGGGCGG CGACCTGAAA ACCATCCTGC ATACCAACAT GCCAAATGTG AACGAGTTCA
14461 TGTTTACCAA TAAGTTAAG GCGCGGGTGA TGGTGTGCG CTTGCCTACT AAGGACAATC
14521 AGGTGGAGCT GAAATACGAG TGGGTGCGAG TCACGCTGCC CGAGGGCAAC TACTCCGAGA
14581 CCATGACCAT AGACCTTATG AACACGCGA TCGTGGAGCA CTACTTGAAA GTGGGCAGAC
14641 AGAACGGGGT TCTGGAAAGC GACATCGGGG TAAAGTTTGA CACCCGCAAC TTCAGACTGG
14701 GGTTTGACCC CGTCACTGGT CTTGTCTATG CTGGGGTATA TACAAACGAA GCCTTCCATC
14761 CAGACATCAT TTTGCTGCCA GGATGCGGGG TGGACTTCAC CCACAGCCGC CTGAGCAACT
14821 TGTTGGGCAT CCGCAAGCGG CAACCTTCC AGGAGGGCTT TAGGATCACC TACGATGATC
14881 TGGAGGGTGG TAACATTCCC GCACTGTTGG ATGTGGACGC CTACCAGGCG AGCTTGAAAG
14941 ATGACACCGA ACAGGGCGGG GGTGGCGCAG GCGGCAGCAA CAGCAGTGGC AGCGGCGCGG
15001 AAGAGAACTC CAACGCGGCA GCCGCGGCAA TGCAGCCGGT GGAGGACATG AACGATCATG
15061 CCATTCGCGG CGACACCTTT GCCACACGGG CTGAGGAGAA GCGCGCTGAG GCCGAAGCAG
15121 CGGCCGAAGC TGCCGCCCCC GCTGCGCAAC CCGAGGTGCA GAAGCCTCAG AAGAAACCGG
15181 TGATCAAAACC CCTGACAGAG GACAGCAAGA AACGCAAGT CAACCTAATA AGCAATGACA
15241 GCACCTTAC CCAGTACCGC AGCTGGTACC TTGCATACAA CTACGGCGAC CCTCAGACCG
15301 GAATCCGCTC ATGGACCCTG CTTTGCACTC CTGACGTAAC CTGCGGCTCG GAGCAGTCT
15361 ACTGGTCGTT GCCAGACATG ATGCAAGACC CCGTGACCTT CCGCTCCAG CGCCAGATCA
15421 GCAACTTTCC GGTGGTGGGC GCCGAGCTGT TGCCCGTGCA CTCCAAGAGC TTCTACAACG
15481 ACCAGGCCGT CTACTCCCAA CTCATCGGCC AGTTTACCTC TCTGACCAC GTGTTCAATC
15541 GCTTTCCCGA GAACCAGATT TTGGCGCGCC CGCCAGCCCC CACCATCACC ACCGTCAGTG
15601 AAAACGTTCC TGCTCTCACA GATCACGGGA CGTACCGCT GCGCAACAGC ATCGGAGGAG
15661 TCCAGCGAGT GACCATTACT GACGCCAGAC GCCGCACCTG CCCCTACGTT TACAAGGCCC
15721 TGGGCATAGT CTCGCCGCGC GTCCTATCGA GCCGCACTTT TTGAGCAAGC ATGTCCATCC
15781 TTATATCGCC CAGCAATAAC ACAGGCTGGG GCCTGCGCTT CCAAGCAAG ATGTTTGGCG
15841 GGGCCAAGAA GCGCTCCGAC CAACACCCAG TGCGCGTGCG GGGGCACTAC CGCGCGCCCT
15901 GGGGCGCGCA CAAACGCGGC CGCACTGGGC GCACCACCGT CGATGACGCC ATCGACGCGG
15961 TGGTGGAGGA GGCGCGCAAC TACACGCCCA CGCCGCCACC AGTGTCCACA GTGGACGCGG
16021 CCATTCAGAC CGTGGTGCGC GGAGCCCGGC GCTATGCTAA AATGAAGAGA CGGCGGAGGC
16081 GCGTAGCAGC TCGCCACCGC CGCCGACCGC GCACTGCGCG CCAACGCGCG CGCGCGGCC

```

```

16141 TGCTTAACCG CGCACGTCGC ACCGGCCGAC GGGCGGCCAT GCGGGCCGCT CGAAGGCTGG
16201 CCGCGGGTAT TGCTACTGTG CCCCCCAGGT CCAGGCGACG AGCGGCCGCC GCAGCAGCCG
16261 CGGCCATTAG TGCTATGACT CAGGGTCGCA GGGGCAACGT GTATTGGGTG CGCGACTCGG
16321 TTAGCGGCCT GCGCGTGCCC GTGCGCACCC GCGCCCGCGG CAACTAGATT GCAAGAAAAA
16381 ACTACTTAGA CTCGTACTGT TGTATGTATC CAGCGGCGGC GCGCGCAAC GAAGCTATGT
16441 CCAAGCGCAA AATCAAAGAA GAGATGCTCC AGGTCATCGC GCCGGAGATC TATGGCCCCC
16501 CGAAGAAGGA AGAGCAGGAT TACAAGCCCC GAAAGCTAAA GCGGGTCAAA AAGAAAAAGA
16561 AAGATGATGA TGATGAACTT GACGACGAGG TGAAGCTGCT GCACGCTACC GCGCCCAGGC
16621 GACGGGTACA GTGGAAGGT CGACGCGTAA AACGTGTTTT GCGACCCGGC ACCACCGTAG
16681 TCTTTACGCC CGGTGAGCGC TCCACCCGCA CCTACAAGCG CGTGTATGAT GAGGTGTACG
16741 GCGACGAGGA CCTGCTTGAG CAGGCCAACG AGCGCCTCGG GGAGTTTGCC TAGGAAAAGC
16801 GGCATAAGGA CATGCTGGCG TTGCCGTGGG ACGAGGGCAA CCAACACCT AGCCTAAAGC
16861 CCGTAACACT GCAGCAGGTG CTGCCCCGCG TTGCACCGTC CGAAGAAAAG CGCGGCCTAA
16921 AGCGCGAGTC TGGTGACTTG GCACCCACCG TGCAGCTGAT GGTACCCAAG CGCCAGCGAC
16981 TGAAGATGT CTTGAAAAAA ATGACCGTGG AACCTGGGCT GGAGCCCGAG GTCCGCGTGC
17041 GGCCAATCAA GCAGGTGGCG CCGGGACTGG GCGTGACGAC CGTGGACGTT CAGATACCCA
17101 CTACCAGTAG CACCAGTATT GCCACCGCCA CAGAGGGCAT GGAGACACAA ACGTCCCCGG
17161 TTGCCTCAGC GGTGGCGGAT GCCGCGGTGC AGGCGGTGCG TGCGGCCGCG TCCAGAACCT
17221 CTACGGAGGT GCAAACGGAC CCGTGGATGT TTCGCGTTTC AGCCCCCGG CGCCCGCGCG
17281 GTTCGAGGAA GTACGGCGCC GCCAGCGCGC TACTGCCCGA ATATGCCCTA CATCCTTCCA
17341 TTGCGCCTAC CCGCGCTAT CGTGGCTACA CCTACCGCCC CAGAAGACGA GCAACTACCC
17401 GACGCCGAAC CACCACTGGA ACCGCGCGCC GCCGTCGCCG TCGCCAGCCC GTGTGGCCCC
17461 CGATTTCCGT GCGCAGGGTG GTCGCGAAG GAGGCAGGAC CCTGGTGCTG CCAACAGCGC
17521 GCTACCACCC CAGCATCGTT TAAAAGCCGG TCTTTGTGGT TCTTGACAGT ATGGCCCTCA
17581 CCTGCCGCCT CCGTTTCCCG GTGCCGGGAT TCCGAGGAAG AATGCACCGT AGGAGGGGCA
17641 TGGCCGGCCA CGGCCTGACG GCGCGCATGC GTCGTGCGCA CCACCGCGCG CGGCGCGCGT
17701 CGCACCGTCG CATGCGCGGC GGTATCCTGC CCCTCCTTAT TCCACTGATC GCCGCGCGGA
17761 TTGGCGCCGT GCCCGGAATT GCATCCGTGG CCTTGCAGGC GCAGAGACAC TGATTAAAAA
17821 CAAGTTGCAT GTGAAAAAAT CAAAATAAAA AGTCTGGACT CTCACGCTCG CTTGGTCTCTG
17881 TAACTATTTT GTAGAATGGA AGACATCAAC TTTGCGTCTC TGGCCCCGCG ACACGGCTCG
17941 CGCCCGTTCA TGGGAAACTG GCAAGATATC GGCACCAGCA ATATGAGCGG TGGCGCCTTC
18001 AGCTGGGGCT CGCTGTGGAG CGGCATTAAA AATTTGCGTT CCACCGTTAA GAACTATGGC
18061 AGCAAGGCCT GGAACAGCAG CACAGGCCAG ATGCTGAGGG ATAAGTTGAA AGAGCAAAAT
18121 TTCCAACAAA AGGTGGTAGA TGGCCTGGCC TCTGGCATTG GCGGGGTGGT GGACCTGGCC
18181 AACCAGGCAG TGCAAAATAA GATTAACAGT AAGCTTGATC CCGGCCCTCC CGTAGAGGAG
18241 CCTCCACCGG CCGTGGAGAC AGTGCTCCA GAGGGGCGTG GCGAAAAGCG TCCGCGCCCC
18301 GACAGGGAAG AACTCTGGT GACGCAATA GACGAGCCTC CCTCGTACGA GGAGGCACTA
18361 AAGCAAGGCC TGCCACCAC CCGTCCCATC GCGCCCATGG CTACCGGAGT GCTGGGCCAG
18421 CACACACCCG TAACGCTGGA CCTGCCTCCC CCGCCGACA CCGAGCAGAA ACCTGTGCTG
18481 CCAGGCCCGA CCGCGTTGT TGTAAACCGT CCTAGCCGCG CGTCCCTGCG CCGCGCCGCC
18541 AGCGGTCCGC GATCGTTGCG GCCCGTAGCC AGTGGCAACT GGCAAAGCAC ACTGAACAGC
18601 ATCGTGGGTC TGGGGTGCA ATCCCTGAAG CGCCGACGAT GCTTCTGAAT AGCTAACGTG
18661 TCGTATGTGT GTCATGTATG CGTCCATGTC GCCGCCAGAG GAGCTGCTGA GCGCCGCGC
18721 GCGCGCTTTC CAAGATGGCT ACCCCTTCCA TGATGCCGCA GTGGTCTTAC ATGCACATCT
18781 CGGGCCAGGA CGCCTCGGAG TACCTGAGCC CCGGGCTGGT GCAGTTTGCC CGCGCCACCG
18841 AGACGTACTT CAGCCTGAAT AACAAAGTTA GAAACCCAC GGTGGCGCCT ACGCACGACG
18901 TGACCACAGA CCGGTCCCAG CGTTTGACGC TCGGTTTCAT CCCTGTGGAC CGTGAGGATA
18961 CTGCGTACTC GTACAAGGCG CGGTTACCCC TAGCTGTGGG TGATAACCGT GTGCTGGACA
19021 TGGCTTCCAC GTACTTTGAC ATCCCGGCG TGCTGGACAG GGGCCCTACT TTAAAGCCCT
19081 ACTCTGGCAC TGCTACAAC GCCCTGGCTC CCAAGGGTGC CCCAAATCCT TGCGAATGGG
19141 ATGAAGCTGC TACTGTCTTT GAAATAAAC TAGAAGAAGA GGACGATGAC AACGAAGACG
19201 AAGTAGACGA GCAAGCTGAG CAGCAAAAAA CTCACGTATT TGGGCAGGCG CTTATTCTG
19261 GTATAAATAT TACAAAGGAG GGTATTCAA TAGGTGTCGA AGGTCAAACA CCTAAATATG
19321 CCGATAAAAC ATTTCAACCT GAACCTCAA TAGGAGAATC TCAGTGGTAC GAAACTGAAA
19381 TTAATCATGC AGCTGGGAGA GTCCTTAAAA AGACTACCCC AATGAAACCA TGTTACGGTT
19441 CATATGCAAA ACCCAAAAT GAAATGGAG GGCAAGGCAT TCTTGTAAG CAACAAAATG
19501 GAAAGCTAGA AAGTCAAGTG GAAATGCAAT TTTTCTCAAC TACTGAGGCG ACCGCAGGCA

```

```

19561 ATGGTGATAA CTTGACTCCT AAAGTGGTAT TGTACAGTGA AGATGTAGAT ATAGAAACCC
19621 CAGACACTCA TATTTCTTAC ATGCCCACCTA TTAAGGAAGG TAACTCACGA GAACTAATGG
19681 GCCAACAATC TATGCCCAAC AGGCCTAATT ACATTGCTTT TAGGGACAAT TTTATTGGTC
19741 TAATGTATTA CAACAGCACG GGTAAATATGG GTGTTCTGGC GGGCCAAGCA TCGCAGTTGA
19801 ATGCTGTTGT AGATTTGCAA GACAGAAACA CAGAGCTTTC ATACCAGCTT TTGCTTGATT
19861 CCATTGGTGA TAGAACCAGG TACTTTTCTA TGTGGAATCA GGCTGTTGAC AGCTATGATC
19921 CAGATGTTAG AATTATTGAA AATCATGGAA CTGAAGATGA ACTTCCAAAT TACTGCTTTC
19981 CACTGGGAGG TGTGATTAAT ACAGAGACTC TTACCAAGGT AAAACCTAAA ACAGGTCAGG
20041 AAAATGGATG GGAAAAAGAT GCTACAGAAT TTTCAGATAA AAATGAAATA AGAGTTGGAA
20101 ATAATTTTGC CATGGAAATC AATCTAAATG CCAACCTGTG GAGAAATTTT CTGTACTCCA
20161 ACATAGCGCT GTATTTGCCC GACAAGCTAA AGTACAGTCC TTCCAACGTA AAAATTTCTG
20221 ATAACCCAAA CACCTACGAC TACATGAACA AGCGAGTGGT GGCTCCCGGG TTAGTGGACT
20281 GCTACATTAA CCTTGGAGCA CGCTGGTCCC TTGACTATAT GGACAACGTC AACCATTTA
20341 ACCACCACCG CAATGCTGGC CTGCGCTACC GCTCAATGTT GCTGGGCAAT GGTGCTATG
20401 TGCCCTTCCA CATCCAGGTG CCTCAGAAGT TCTTTGCCAT TAAAAACCTC CTTCTCCTGC
20461 CGGGCTCATA CACCTACGAG TGGAACTTCA GGAAGGATGT TAACATGGTT CTGCAGAGCT
20521 CCCTAGGAAA TGACCTAAGG GTTGACGGAG CCAGCATTAA GTTTGATAGC ATTTGCCTTT
20581 ACGCCACCTT CTTCCCCATG GCCACAACA CCGCTCCAC GCTTGAGGCC ATGCTTAGAA
20641 ACGACACCAA CGACCAGTCC TTAAACGACT ATCTCTCCGC CGCCAACATG CTCTACCCTA
20701 TACCCGCCAA CGCTACCAAC GTGCCCATAT CCATCCCCTC CCGCAACTGG GCGGCTTTCC
20761 GCGGCTGGGC CTTACGCGC CTTAAGACTA AGGAAACCCC ATCACTGGGC TCGGGCTACG
20821 ACCCTTATTA CACCTACTCT GGCTCTATAC CCTACCTAGA TGGAACCTTT TACCTCAACC
20881 ACACCTTTAA GAAGGTGGCC ATTACCTTTG ACTCTTCTGT CAGCTGGCCT GGCAATGACC
20941 GCCTGCTTAC CCCCAACGAG TTTGAAATTA AGCGCTCAGT TGACGGGGAG GGTTACAACG
21001 TTGCCCAGTG TAACATGACC AAAGACTGGT TCCTGGTACA AATGCTAGCT AACTACAACA
21061 TTGGCTACCA GGGCTTCTAT ATCCCAGAGA GCTACAAGGA CCGCATGTAC TCCTTCTTTA
21121 GAAACTTTCCA GCCCATGAGC CGTCAGGTGG TGGATGATAC TAAATACAAG GACTACCAAC
21181 AGGTGGGCAT CCTACACCAA CACAACAAT CTGGATTTGT TGGCTACCTT GCCCCCACCA
21241 TGCGCGAAGG ACAGGCCTAC CCTGCTAACT TCCCTATCC GCTTATAGGC AAGACCGCAG
21301 TTGACAGCAT TACCCAGAAA AAGTTTCTTT GCGATCGCAC CCTTTGGCGC ATCCCATTCT
21361 CCAGTAACTT TATGTCCATG GCGCACTCA CAGACCTGGG CCAAAACCTT CTCACGCCA
21421 ACTCCGCCCA CGCGCTAGAC ATGACTTTTG AGGTGGATCC CATGGACGAG CCCACCCTTC
21481 TTTATGTTTT GTTTGAAGTC TTTGACGTGG TCCGTGTGCA CCGGCCGCAC CGCGGCGTCA
21541 TCGAAACCGT GTACCTGCGC ACGCCCTTCT CGGCCGGCAA CGCCACAACA TAAAGAAGCA
21601 AGCAACATCA ACAACAGCTG CCGCCATGGG CTCCAGTGAG CAGGAACTGA AAGCCATTGT
21661 CAAAGATCTT GGTGTGGGGC CATATTTTTT GGGCACCTAT GACAAGCGCT TTCCAGGCTT
21721 TGTTTCTCCA CACAAGCTCG CCTGCGCCAT AGTCAATACG GCCGGTCGCG AGACTGGGGG
21781 CGTACACTGG ATGGCCTTTG CCTGGAACCC GCACTCAAAA ACATGCTACC TCTTTGAGCC
21841 CTTTGGCTTT TCTGACCAGC GACTCAAGCA GGTTTACCAG TTTGAGTACG AGTCACTCCT
21901 GCGCCGTAGC GCCATTGCTT CTTCCCCCGA CCGCTGTATA ACGCTGGAAG AGTCCACCCA
21961 AAGCGTACAG GGGCCCAACT CGGCCGCTG TGGACTATTG TGCTGCATGT TTCTCCACGC
22021 CTTTGCCAAC TGGCCCCAAA CTCCCATGGA TCACAACCCC ACCATGAACC TTATTACCGG
22081 GGTACCCAAC TCCATGCTCA ACAGTCCCCA GGTACAGCCC ACCCTGCGTC GCAACCAGGA
22141 ACAGCTCTAC AGCTTCTTGG AGCGCCACTC GCCCTACTTC CGCAGCCACA GTGCGCAGAT
22201 TAGGAGCGCC ACTTCTTTTT GTCACTTGAA AAACATGTAA AAATAATGTA CTAGAGACAC
22261 TTTCAATAAA GGCAAATGCT TTTATTTGTA CACTCTCGGG TGATTATTTA CCCCCACCTT
22321 TGCCGTCTGC GCCGTTTAAA AATCAAAGGG GTTCTGCCGC GCATCGCTAT GCGCCACTGG
22381 CAGGGACACG TTGCGATACT GGTGTTTAGT GCTCCACTTA AACTCAGGCA CAACCATCCG
22441 CGGCAGCTCG GTGAAGTTTT CACTCCACAG GCTGCGCACC ATCACCACG CGTTTAGCAG
22501 GTCGGGCGCC GATATCTTGA AGTCGCAGTT GGGGCCTCCG CCCTGCGCGC GCGAGTTGCG
22561 ATACACAGGG TTGCAGCACT GGAACACTAT CAGCGCCGGG TGGTGACGCG TGGCCAGCAC
22621 GCTCTTGTG GAGATCAGAT CCGCGTCCAG GTCCTCCGCG TTGCTCAGGG CGAACGGAGT
22681 CAACTTTGGT AGCTGCCTTC CCAAAAAGGG CGCGTGCCCA GGCTTTGAGT TGCACTCGCA
22741 CCGTAGTGCG ATCAAAAGGT GACCGTGCCC GGTCTGGGCG TTAGGATACA GCGCCTGCAT
22801 AAAAGCCTTG ATCTGCTTAA AAGCCACCTG AGCCTTTGCG CCTTCAGAGA AGAACATGCC
22861 GCAAGACTTG CCGGAAAACCT GATTGGCCGG ACAGGCCGCG TCGTGACGCG AGCACCTTGC
22921 GTCGGTGTG GAGATCTGCA CCACATTTG GCCCCACCGG TTCTTCACGA TCTTGGCCTT

```

22981 GCTAGACTGC TCCTTCAGCG CGCGCTGCCC GTTTTCGCTC GTCACATCCA TTTCAATCAC
23041 GTGCTCCTTA TTTATCATAA TGCTTCCGTG TAGACACTTA AGCTCGCCTT CGATCTCAGC
23101 GCAGCGGTGC AGCCACAACG CGCAGCCCGT GGGCTCGTGA TGCTTGTAAG TCACCTCTGC
23161 AAACGACTGC AGGTACGCCT GCAGGAATCG CCCCATCATC GTCACAAAGG TCTTGTTGCT
23221 GGTGAAGGTC AGCTGCAACC CGCGGTGCTC CTCGTTCAGC CAGGTCTTGC ATACGGCCGC
23281 CAGAGCTTCC ACTTGGTCAG GCAGTAGTTT GAAGTTCGCC TTTAGATCGT TATCCACGTG
23341 GTAATTGTCC ATCAGCGCGC GCGCAGCCTC CATGCCCTTC TCCCACGCAG ACACGATCGG
23401 CACACTCAGC GGGTTCATCA CCGTAATTTT ACTTTCCGCT TCGCTGGGCT CTTCCTCTTC
23461 CTCTTGCGTC CGCATACCAC GCGCCACTGG GTCGTCTTCA TTCAGCCGCC GCACGTGCG
23521 CTTACCTCCT TTGCCATGCT TGATTAGCAC CGGTGGGTTG CTGAAACCCA CCATTGTAG
23581 CGCCACATCT TCTCTTTCTT CCTCGCTGTC CACGATTACC TCTGGTGATG GCGGGCGCTC
23641 GGGCTTGGA GAAGGGCGCT TCTTTTCTT CTTGGGCGCA ATGGCCAAAT CCGCCGCCGA
23701 GGTGATGGC CGCGGGCTGG GTGTGCGCGG CACCAGCGCG TCTTGATGAG AGTCTTCTC
23761 GTCTCGGAC TCGATACGCC GCCTCATCCG CTTTTTTGGG GCGCGCCGGG GAGGCGCGG
23821 CGACGGGGAC GGGGACGACA CGTCTCCAT GGTGGGGGA CGTCGCGCCG CACCGGTCC
23881 GCGCTCGGGG GTGGTTTCGC GCTGTCTCTC TTCCGACTG GCCATTTCCT TCTCTGTAG
23941 CAGAAAAAG ATCATGGAGT CAGTCGAGAA GAAGGACAGC CTAACCGCCC CCTCTGAGTT
24001 CGCCACCACC GCCTCCACCG ATGCCGCCAA CGCGCTACC ACCTTCCCCG TCGAGGCACC
24061 CCCGCTTGAG GAGGAGGAAG TGATTATCGA GCAGGACCCA GGTTTTGTA GCGAAGACGA
24121 CGAGGACCGC TCAGTACCAA CAGAGGATAA AAAGCAAGAC CAGGACAACG CAGAGGCAAA
24181 CGAGGAACAA GTCGGGCGGG GGGACGAAAG GCATGGCGAC TACCTAGATG TGGGAGACGA
24241 CGTGCTGTTG AAGCATCTGC AGCGCCAGTG CGCCATTATC TGCGACGCGT TGCAAGACG
24301 CAGCGATGTG CCCCTCGCCA TAGCGGATGT CAGCCTTGCC TACGAACGCC ACCTATTCTC
24361 ACCGCGCGTA CCCCCCAAAC GCGCACATGC GAGCCCAACC CGCGCTCAA
24421 CTTCTACCCC GTATTTGCCG TGCCAGAGGT GCTTGCCACC TATCACATCT TTTTCCAAA
24481 CTGCAAGATA CCCCTATCCT GCCGTGCCAA CCGCAGCCGA GCGGACAAGC AGCTGGCCTT
24541 GCGGACGGG GCTGTCTATC CTGATATCGC CTCGCTCAAC GAAGTGCCAA AAATCTTGA
24601 GGGTCTTGGA CGCGACGAGA AGCGCGCGG AAACGCTCTG CAACAGGAAA ACAGCGAAAA
24661 TGAAAGTCAC TCTGGAGTGT TGGTGGAACT CGAGGGTGAC AACGCGCGCC TAGCGTACT
24721 AAAACGCAGC ATCGAGGTCA CCCACTTTCG CTACCCGCGA CTTAACCTAC CCCCCAAGGT
24781 CATGAGCACA GTCATGAGTG AGCTGATCGT GCGCCGTGCG CAGCCCCTGG AGAGGGATGC
24841 AAATTTGCAA GAACAAACAG AGGAGGGCCT ACCCGCAGTT GCGGACGAGC AGCTAGCGCG
24901 CTGGCTTCAA ACGCGCGAGC CTGCCGACTT GGAGGAGCGA CGCAAACATA TGATGGCCGC
24961 AGTGCTCGTT ACCGTGGAGC TTGAGTGAT GCAGCGGTTT TTTGCTGACC CGGAGATGCA
25021 GCGCAAGCTA GAGGAAACAT TGCACTACAC CTTTCGACAG GGCTACGTAC GCCAGGCTG
25081 CAAGATCTCC AACGTGGAGC TCTGCAACCT GGTCTCCTAC CTTGGAATTT TGACGAAAA
25141 CCGCCTTGGG CAAAACGTGC TTCATTCCAC GCTCAAGGGC GAGGCGCGCC GCGACTACGT
25201 CCGCGACTGC GTTTACTTAT TTCTATGCTA CACCTGGCAG ACGGCCATGG GCGTTTGGA
25261 GCAGTGCTTG GAGGAGTGCA ACCTCAAGGA GCTGCAGAAA CTGCTAAAGC AAAACTTGAA
25321 GGACCTATGG ACGGCCTTCA ACGAGCGCTC CGTGGCCGCG CACCTGGCGG ACATCATTTT
25381 CCGCAACGCG CTGCTTAAAA CCCTGCAACA GGGTCTGCCA GACTTCACCA GTCAAAGCAT
25441 GTTGCAAGAA TTTAGGAAT TTATCCTAGA GCGCTCAGGA ATCTTGCCCG CCACCTGCTG
25501 TGCACTTCCT AGCGACTTTG TGCCCAATTA GTACCGCGAA TGCCCTCCGC CGCTTTGGGG
25561 CCACTGTCTAC CTTCTGCAGC TAGCCAACTA CTTTGCCCTAC CACTCTGACA TAATGGAAGA
25621 CGTGAGCGGT GACGGTCTAC TGGAGTGCA CTGTGCTGTC AACCTATGCA CCGCGCACCG
25681 CTCCCTGGTT TGCAATTTCG AGCTGCTTAA CGAAAGTCAA ATTATCGGTA CCTTTGAGCT
25741 GCAGGGTCCC TCGCCTGACG AAAAGTCCGC GGCTCCGGGG TTGAAACTCA CTCCGGGGCT
25801 GTGGACGTCG GCTTACCTTC GCAAATTTGT ACCTGAGGAC TACCACGCCC ACGAGATTAG
25861 GTTCTACGAA GACCAATCCC GCGCGCCAAA TGCGGAGCTT ACCGCTGCG TCATTACCCA
25921 GGGCCACATT CTTGGCCAAT TGCAAGCCAT CAACAAAGCC CGCCAAGAGT TTCTGCTACG
25981 AAAGGGACGG GGGGTTTACT TGGACCCCA GTCCGGCGAG GAGCTCAACC CAATCCCCC
26041 GCGCGCGCAG CCCTATCAGC AGCAGCCGCG GGCCCTTGCT TCCAGGATG GCACCCAAAA
26101 AGAAGCTGCA GCTGCCGCCG CCACCCACGG ACGAGGAGGA ATACTGGGAC AGTCAGGCAG
26161 AGGAGGTTTT GGACGAGGAG GAGGAGGACA TGATGGAAGA CTGGGAGAGC CTAGACGAGG
26221 AAGCTTCCGA GGTGGAAGAG GTGTGAGACG AAACACCGTC ACCCTCGGTC GCATTCCCCT
26281 CGCCGGCGCC CCAGAAATCG GCAACCGGTT CCAGCATGGC TACAACCTCC GCTCTCAGG
26341 CGCCGGCGGC ACTGCCCGTT CGCCGACCCA ACCGTAGATG GGACACCACT GGAACCAGGG

26401	CCGGTAAGTC	CAAGCAGCCG	CCGCCGTTAG	CCCAAGAGCA	ACAACAGCGC	CAAGGCTACC
26461	GCTCATGGCG	CGGGCACAAG	AACGCCATAG	TGCTTGCTT	GCAAGACTGT	GGGGGCAACA
26521	TCTCCTTCGC	CCGCCGCTTT	CTTCTCTACC	ATCACGGCGT	GGCCTTCCCC	CGTAACATCC
26581	TGCATTACTA	CCGTCTCTC	TACAGCCCAT	ACTGCACCGG	CGGCAGCGGC	AGCGGCAGCA
26641	ACAGCAGCGG	CCACACAGAA	GCAAAGGCGA	CCGGATAGCA	AGACTCTGAC	AAAGCCCAAG
26701	AAATCCACAG	CGGCGGCAGC	AGCAGGAGGA	GGAGCGCTGC	GTCTGGCGCC	CAACGAACCC
26761	GTATCGACCC	GCGAGCTTAG	AAACAGGATT	TTTCCCACTC	TGTATGCTAT	ATTTCAACAG
26821	AGCAGGGGCC	AAGAACAAGA	GCTGAAAATA	AAAAACAGGT	CTCTGCGATC	CCTCACCCGC
26881	AGCTGCCTGT	ATCACAAAAG	CGAAGATCAG	CTTCGGCGCA	CGCTGGAAGA	CGCGGAGGCT
26941	CTCTTCAGTA	AATACTGCGC	GCTGACTCTT	AAGGACTAGT	TTCGCGCCCT	TTCTCAAATT
27001	TAAGCGCGAA	AACACGTCA	TCTCCAGCGG	CCACACCCGG	CGCCAGCACC	TGTCGTCAGC
27061	GCCATTATGA	GCAAGGAAAT	TCCCACGCCC	TACATGTGGA	GTTACCAGCC	ACAAATGGGA
27121	CTTGCGGCTG	GAGCTGCCCA	AGACTACTCA	ACCCGAATAA	ACTACATGAG	CGCGGGACCC
27181	CACATGATAT	CCCGGGTCAA	CGGAATCCGC	GCCCACCGAA	ACCGAATTCT	CTTGGAACAG
27241	GCGGCTATTA	CCACCACACC	TCGTAATAAC	CTTAATCCCC	GTAGTTGGCC	CGCTGCCCTG
27301	GTGTACCAGG	AAAGTCCCGC	TCCCACCACT	GTGGTACTTC	CCAGAGACGC	CCAGGCCGAA
27361	GTTTCAGATG	CTAACTCAGG	GGCGCAGCTT	GCGGGCGGCT	TTCGTCAAG	GGTGCAGTGC
27421	CCCGGGCAGG	GTATAACTCA	CCTGACAATC	AGAGGGCGAG	GTATTTCAGT	CAACGACGAG
27481	TCGGTGAGCT	CCTCGCTTGG	TCTCCGTCGG	GACGGGACAT	TTGAGATCGG	CGGCGCCGGC
27541	CGTCCTTCAT	TCACGCTCTG	TCAGGCAATC	CTAACTCTGC	AGACCTCGTC	CTCTGAGCCG
27601	CGCTCTGGAG	GCATTGGAAG	TCTGCAATTT	ATTGAGGAGT	TTGTGCCATC	GGTCTACTTT
27661	AACCCCTTCT	CGGGACCTCC	CGGCCACTAT	CCGGATCAAT	TTATTCCTAA	CTTTGACGCG
27721	GTAAAGGACT	CGGCGGACGG	CTACGACTGA	TAATTAAGTG	GAGAGGCAGA	GCAACTGCGC
27781	CTGAAACACC	TGGTCCACTG	TCGCCGCCAC	AAGTGCTTTG	CCCGCGACTC	CGGTGAGTTT
27841	TGCTACTTTG	AATTGCCCGA	GGATCATATC	GAGGATCTTT	GTTGCCATCT	CTGTGCTGAG
27901	TATAATAAAT	ACAGAAATTA	AAATATACTG	GGGCTCCTAT	CGCCATCCTG	TAAACGCCAC
27961	CGTCTTCACC	CGCCCAAGCA	AACCAAGGCG	AACCTTACCT	GGTACTTTTA	ACATCTCTCC
28021	CTCTGTGATT	TACAACAGTT	TCAACCCAGA	CGGAGTGAGT	CTACGAGAGA	ACCTCTCCGA
28081	GCTCAGCTAC	TCCATCAGAA	AAAACACCAC	CCTCCTTACC	TGCCGGGAAC	GTACCCTTAA
28141	TTAAAAGTCA	GGCTTCCTGG	ATGTCAGCAT	CTGACTTTGG	CCAGCACCTG	TCCCGCGGAT
28201	TTGTTCCAGT	CCAACACAG	CGACCCACCC	TAACAGAGAT	GACCAACACA	ACCAACCGCG
28261	CCGCCGCTAC	CGGACTTACA	TCTACCACAA	ATACACCCCA	AGTTTCTGCC	TTTGTCAATA
28321	ACTGGGATAA	CTTGGGCATG	TGGTGGTTCT	CCATAGCGCT	TATGTTTGTG	TGCTTTATTA
28381	TTATGTGGCT	CATCTGCTGC	CTAAGAGCGA	AACGCGCCCG	ACCACCCATC	TATAGTCCCA
28441	TCATTGTGCT	ACACCCAAAC	AATGATGGAA	TCCATAGATT	GGACGGACTG	AAACACATGT
28501	TCTTTTCTCT	TACAGTATGA	TTAAATGAGA	TTAATTAAGG	AATTTCTGTC	CAGTTTATTC
28561	AGCAGCACCT	CCTTGCCCTC	CTCCCAGCTC	TGGTATTGCA	GCTTCCTCCT	GGCTGCAAAC
28621	TTTCTCCACA	ATCTAAATGG	AATGTCAGTT	TCCTCCTGTT	CCTGTCCATC	CGCACCCACT
28681	ATCTTCATGT	TGTTGCAGAT	GAAGCGCGCA	AGACCGTCTG	AAGATACTT	CAACCCCGTG
28741	TATCCATATG	ACACGGAAAC	CGTCCCTCCA	ACTGTGCCTT	TTCTTACTCC	TCCCTTTGTA
28801	TCCCCCAATG	GGTTTCAAGA	GAGTCCCCCT	GGGGTACTCT	CTTTGCGCCT	ATCCGAACCT
28861	CTAGTTACCT	CCAATGGCAT	GCTTGCGCTC	AAAATGGGCA	ACGGCCTCTC	TCTGGACGAG
28921	GCCGGCAACC	TTACCTCCCA	AAATGTAACC	ACTGTGAGCC	CACCTCTCAA	AAAAACCAAG
28981	TCAAACATAA	ACCTGGAAAT	ATCTGCACCC	CTCACAGTTA	CCTCAGAAGC	CCTAAGTGTG
29041	GCTGCCGCGC	CACCTCTAAT	GGTCGCGGGC	AACACACTCA	CCATGCAATC	ACAGGCCCCG
29101	CTAACCGTGC	ACGACTCCAA	ACTTAGCATT	GCCACCCAAG	GACCCCTCAC	AGTGTCAAGAA
29161	GGAAAGCTAG	CCCTGCAAAC	ATCAGGCCCC	CTCACCACCA	CCGATAGCAG	TACCCTTACT
29221	ATCACTGCCT	CACCCCTCT	AACTACTGCC	ACTGGTAGCT	TGGGCATTGA	CTTGAAAGAG
29281	CCCATTATTA	CACAAAATGG	AAAACAGGGA	CTAAAGTACG	GGGCTCCTTT	GCATGTAACA
29341	GACGACCTAA	ACACTTTGAC	CGTAGCAACT	GGTCCAGGTG	TGACTATTAA	TAATACTTCC
29401	TTGCAAACTA	AAGTTACTGG	AGCCTTGGGT	TTTGATTAC	AAGGCAATAT	GCAACTTAAT
29461	GTAGCAGGAG	GACTAAGGAT	TGATTCTCAA	AACAGACGCC	TTTACTTTGA	TGTTAGTTAT
29521	CCGTTTGATG	CTCAAAACCA	ACTAAATCTA	AGACTAGGAC	AGGGCCCTCT	TTTTATAAAC
29581	TCAGCCCA	ACTTGATAT	TAACATAAC	AAAGGCCTTT	ACTTGTTTAC	AGCTTCAAAC
29641	AATTCCAAAA	AGCTTGAGGT	TAACCTAAGC	ACTGCCAAGG	GGTTGATGTT	TGACGCTACA
29701	GCCATAGCCA	TTAATGCAGG	AGATGGGCTT	GAATTTGGTT	CACCTAATGC	ACCAAACACA
29761	AATCCCTCA	AAACAAAAT	TGGCCATGGC	CTAGAATTTG	ATTCAAACAA	GGCTATGGTT

FIGURE 22
(SHEET 9)

42/660

```

29821 CCTAAACTAG GAACTGGCCT TAGTTTTGAC AGCACAGGTG CCATTACAGT AGGAAACAAA
29881 AATAATGATA AGCTAACTTT GTGGACCACA CCAGCTCCAT CTCCTAACTG TAGACTAAAT
29941 GCAGAGAAAG ATGCTAAACT CACTTTGGTC TTAACAAAAT GTGGCAGTCA AATACTTGCT
30001 ACAGTTTCAG TTTTGGCTGT TAAAGGCAGT TTGGCTCCAA TATCTGGAAC AGTTCAAAGT
30061 GCTCATCTTA TTATAAGATT TGACGAAAAAT GGAGTGCTAC TAAACAATTG CTTCTCGGAC
30121 CCAGAATATT GGAACCTTTAG AAATGGAGAT CTTACTGAAG GCACAGCCTA TACAAACGCT
30181 GTTGGATTTA TGCCTAACCT ATCAGCTTAT CCAAAATCTC ACGGTA AAC TGCCAAAAGT
30241 AACATTGTCA GTCAAGTTTA CTTAAACGGA GACAAAAC TA AACCTGTAAC ACTAACCAT
30301 AACTAAACG GTACACAGGA AACAGGAGAC ACAACTCCAA GTGCATACTC TATGTCAATT
30361 TCATGGGACT GGTCTGGCCA CAACTACATT AATGAAATAT TTGCCACATC CTCTTACACT
30421 TTTTCATACA TTGCCAAGA ATAAAGAATC GTTTGTGTTA TGTTCACAG TGTTCATTTT
30481 TCAATTGCAG AAAATTTCAA GTCATTTTTC ATTCAAGTAG ATAGCCCCAC CACCACATAG
30541 CTTATACAGA TCACCGTACC TTAATCAAAC TCACAGAACC CTAGTATTCA ACCTGCCACC
30601 TCCCTCCCAA CACACAGAGT ACACAGTCCT TTCTCCCCGG CTGGCCTTAA AAAGCATCAT
30661 ATCATGGGTA ACAGACATAT TCTTAGGTGT TATATTCCAC ACGGTTTCCT GTCGAGCCAA
30721 ACCTCATCA GTGATATTAA TAACTCCCC GGGCAGCTCA CTTAAGTTCA TGTCGCTGTC
30781 CAGCTGCTGA GCCACAGGCT GCTGTCCAAC TTGCGGTTGC TTAACGGGCG GCGAAGGAGA
30841 AGTCCACGCC TACATGGGGG TAGAGTCATA ATCGTGCATC AGGATAGGGC GGTGGTGCTG
30901 CAGCAGCGCG CGAATAAACT GCTGCCGCCG CCGCTCCGTC CTGCAGGAAT ACAACATGGC
30961 AGTGGTCTCC TCAGCGATGA TTCGCACCGC CCGCAGCATA AGGCGCCTTG TCCTCCGGGC
31021 ACAGCAGCGC ACCCTGATCT CACTTAAATC AGCACAGTAA CTGCAGCACA GCACCACAAT
31081 ATTGTTCAAA ATCCACAGT GCAAGGCGCT GTATCCAAAG CTCATGGCGG GGACCACAGA
31141 ACCCAGTGG CCATCATACC ACAAGCGCAG GTAGATTAAG TGGCGACCCC TCATAAACAC
31201 GCTGGACATA AACATTACCT CTTTGGCAT GTTGTAATTC ACCACCTCCC GGTACCATAT
31261 AAACCTCTGA TTAACATGG CGCCATCCAC CACCATCCTA AACCAGCTGG CCAAAACCTG
31321 CCCGCCGGCT ATACACTGCA GGGAACCGGG ACTGGAACAA TGACAGTGGG GAGCCAGGA
31381 CTCGTAACCA TGGATCATCA TGCTCGTCAT GATATCAATG TTGGCACAAC ACAGGCACAC
31441 GTGCATACAC TTCCTCAGGA TTACAAGCTC CTCCCGCGTT AGAACCATAT CCCAGGGAAC
31501 AACCATTCC TGAATCAGCG TAAATCCAC ACTGCAGGGA AGACCTCGCA CGTAATCAC
31561 GTTGTGCATT GTCAAAGTGT TACATTCGGG CAGCAGCGGA TGATCCTCCA GTATGGTAGC
31621 GCGGGTTTCT GTCTCAAAAG GAGGTAGACG ATCCCTACTG TACGGAGTGC CCGGAGACAA
31681 CCGAGATCGT GTTGGTCGTA GTGTCATGCC AAATGGAACG CCGGACGTAG TCATATTTCC
31741 TGAAGCAAAA CCAGGTGCGG GCGTGACAAA CAGATCTGCG TCTCCGGTCT CGCCGCTTAG
31801 ATCGTCTGT GTAGTAGTTG TAGTATATCC ACTCTCTCAA AGCATCCAGG CGCCCCCTGG
31861 CTTGCGGTTT TATGTAAACT CCTTCATGCG CCGCTGCCCT GATAACATCC ACCACCGCAG
31921 AATAAGCCAC ACCCAGCCAA CCTACACATT CGTTCTGCGA GTCACACACG GGAGGAGCGG
31981 GAAGAGCTGG AAGAACCATG TTTTTTTTTT TATTCCAAA GATTATCCAA AACCTCAAAA
32041 TGAAGATCTA TTAAGTGAAC GCGCTCCCTT CCGGTGGCGT GGTCAAACCTC TACAGCCAAA
32101 GAACAGATAA TGGCATTTGT AAGATGTTGC ACAATGGCTT CCAAAAGGCA AACGGCCCTC
32161 ACGTCCAAGT GGACGTAAAG GCTAAACCTT TCAGGGTGAA TCTCCTCTAT AAACATTCCA
32221 GCACCTTCAA CCATGCCCAA ATAATTCTCA TCTCGCCACC TTCTCAATAT ATCTCTAAGC
32281 AAATCCCGAA TATTAAGTCC GGCCATTGTA AAAATCTGCT CCAGAGCGCC CTCCACCTTC
32341 AGCCTCAAGC AGCGAATCAT GATTGCAAAA ATTCAGTTTC CTCACAGACC TGTATAAGAT
32401 TCAAAAGCGG AACATTAACA AAAATACCGC GATCCCGTAG GTCCCTTCGC AGGGACAGCT
32461 GAACATAATC GTGCAGGTCT GCACGGACCA GCGCGGCCAC TTCCCGCCA GGAACCTTGA
32521 CAAAAGAACC CACACTGATT ATGACACGCA TACTCGGAGC TATGCTAACC AGCGTAGCCC
32581 CGATGTAAGC TTTGTGTCAT GGGCGCGCAT ATAAAATGCA AGGTGCTGCT CAAAAAATCA
32641 GGCAAAGCCT CGCGCAAAAA AGAAAGCACA TCGTAGTCAT GTCATGCAG ATAAAGGCAG
32701 GTAAGCTCCG GAACCACCAC AGAAAAAGAC ACCATTTTTT TCTCAAACAT GTCTGCGGGT
32761 TTCTGCATAA ACACAAAATA AAATAACAAA AAAACATTTA AACATTAGAA GCCTGCTTTA
32821 CAACAGGAAA AACAAACCTT ATAAGCATAA GACGGACTAC GGCCATGCCG GCGTGACCGT
32881 AAAAAAACTG GTCACCGTGA TTA AAAAGCA CCACCGACAG CTCCTCGGTC ATGTCCGGAG
32941 TCATAATGTA AGACTCGGTA AACACATCAG GTTGATTTCAT CCGTCAGTGC TAAAAAGCGA
33001 CCGAAATAGC CCGGGGGAAT ACATACCCGC AGGCGTAGAG ACAACATTAC AGCCCCCATA
33061 GGAGGTATAA CAAAATTAAT AGGAGAGAAA AACACATAAA CACCTGAAAA ACCCTCCTGC
33121 CTAGGCAAAA TAGCACCTC CCGCTCCAGA ACAACATACA GCGCTTCACA GCGGACCGCT
33181 AACAGTCAGC CTTACCAGTA AAAAGAAAAA CCTATTAAAA AACACCACT CGACACGGCA

```

FIGURE 22
(SHEET 10)

33241 CCAGCTCAAT CAGTCACAGT GTAAAAAAGG GCCAAGTGCA GAGCGAGTAT ATATAGGACT
33301 AAAAAATGAC GTAACGGTTA AAGTCCACAA AAAACACCCA GAAAACCGCA CGCGAACCTA
33361 CGCCCAGAAA CGAAAGCCAA AAAACCCACA ACTTCCTCAA ATCGTCACTT CCGTTTTCCC
33421 ACGTTACGTA ACTTCCATT TTAAGAAAAC TACAATTCCC AACACATACA AGTTACTCCG
33481 CCCTAAAACC TACGTCACCC GCCCCGTTCC CACGCCCCGC GCCACGTCAC AAACTCCACC
33541 CCCTCATTAT CATATTGGCT TCAATCCAAA ATAAGGTATA TTATTGATGA TG

//

LOCUS KD3 34341 bp DNA SYN 06-FEB-1999
 DEFINITION KD3
 ACCESSION KD3
 KEYWORDS .
 SOURCE Unknown.
 ORGANISM Unknown
 Unclassified.
 REFERENCE 1 (bases 1 to 34341)
 AUTHORS Self
 JOURNAL Unpublished.
 FEATURES Location/Qualifiers
 CDS 1..34341
 /gene="KD3"
 /product="KD3"
 BASE COUNT 7951 a 9671 c 9464 g 7255 t
 ORIGIN
 1 CATCATCAAT AATATACCTT ATTTTGGATT GAAGCCAATA TGATAATGAG GGGGTGGAGT
 61 TTGTGACGTG GCGCGGGGCG TGGGAACGGG GCGGGTGACG TAGTAGTGTG GCGGAAGTGT
 121 GATGTTGCAA GTGTGGCGGA ACACATGTAA GCGACGGATG TGGCAAAAGT GACGTTTTTG
 181 GTGTGCGCCG GTGTACACAG GAAGTGACAA TTTTCGCGCG GTTTTAGGCG GATGTTGTAG
 241 TAAATTTGGG CGTAACCGAG TAAGATTGG CCATTTTCGC GGGAAACTG AATAAGAGGA
 301 AGTGAAATCT GAATAATTTT GTGTTACTCA TAGCGCGTAA TATTTGTCTA GGGCCGCGGG
 361 GACTTTGACC GTTTACGTGG AGACTCGCCC AGGTGTTTTT CTCAGGTGTT TTCCGCGTTC
 421 CGGGTCAAAG TTGGCGTTTT ATTATTATAG TCAGCTGACG TGTAGTGTAT TTATACCCGG
 481 TGAGTTCCTC AAGAGGCCAC TCTTGAGTGC CAGCGAGTAG AGTTTTCTCC TCCGAGCCGC
 541 TCCGACACCG GGAAGTAAAA TGAGACATGA GGTACTGGCT GATAATCTTC CACCTCCTAG
 601 CCATTTTGAA CCACCTACCC TTCACGAACT GTATGATTTA GACGTGACGG CCCCCGAAGA
 661 TCCCAACGAG GAGGCGGTTT CGCAGATTTT TCCCGACTCT GTAATGTTGG CGGTGCAGGA
 721 AGGGATTGAC TTACTCACTT TTCCGCGGCG GCCCGGTTCT CCGGAGCCGC CTCACCTTTC
 781 CCGGCAGCCC GAGCAGCCGG AGCAGAGAGC CTTGGGTCCG GTTGCCACG AGGCTGGCTT
 841 TCCACCCAGT GACGACGAGG ATGAAGAGGG TGAGGAGTTT GTGTTAGATT ATGTGGAGCA
 901 CCCCAGGCAC GGTGTCAGGT CTTGTCATTA TCACCGAGG AATACGGGG ACCCAGATAT
 961 TATGTGTTCT CTTTGCTATA TGAGGACCTG TGGCATGTTT GTCTACAGTA AGTGAAAATT
 1021 ATGGGCACTG GGTGATAGAG TGGTGGGTTT GGTGTGGTAA TTTTTTTTTT AATTTTTACA
 1081 GTTTTGTGGT TTAAAGAATT TTGTATTGTG ATTTTTTTAA AAGGTCCTGT GTCTGAACCT
 1141 GAGCCTGAGC CCGAGCCAGA ACCGGAGCCT GCAAGACCTA CCCGCGTCC TAAAATGGCG
 1201 CACTGCTATC TGAGACGCCC GACATCACCT GTGTCTAGAG AATGCAATAG TAGTACGGAT
 1261 AGCTGTGACT CCGGTCCTTC TAACACACCT CCTGAGATAC ACCCGGTGGT CCCGCTGTGC
 1321 CCCATTAAAC CAGTTGCCGT GAGAGTTGGT GGGCGTCGCC AGGCTGTGGA ATGTATCGAG
 1381 GACTTGCTTA ACAGGCTTGG GCAACCTTTG GACTTGAGCT GTAAACGCCC CAGGCCATAA
 1441 GGTGTAAACC TGTGATTGCG TGTGTGGTTA ACGCCTTTGT TTGCTGAATG AGTTGATGTA
 1501 AGTTTAAATA AGGGTGAGAT AATGTTTAACT TTGCATGGCG TGTTAAATGG GCGCGGGCTT
 1561 AAAGGGTATA TAATGCGCCG TGGGCTAATC TTGGTTACAT CTGACCTCAT GGAGGCTTGG
 1621 GAGTGTTTGG AAGATTTTTT TGCTGTGCGT AACTTGCTGG AACAGAGCTC TAACAGTACC
 1681 TCTTGGTTTT GGAGGTTTCT GTGGGGCTCA TCCCAGGCAA AGTTAGTCTG CAGAATTAAG
 1741 GAGGATTACA AGTGGGAATT TGAAGAGCTT TTGAAATCCT GTGGTGAGCT GTTTGATTCT
 1801 TTGAATCTGG GTCACCAGGC GCTTTTCCAA GAGAAGGTCA TCAAGACTTT GGATTTTTC
 1861 ACACCGGGGC GCGCTGCGGC TGCTGTTGCT TTTTGTAGTT TTATAAAGGA TAAATGGAGC
 1921 GAAGAAACCC ATCTGAGCGG GGGGTACCTG CTGGATTTTC TGGCCATGCA TCTGTGGAGA
 1981 GCGGTTGTGA GACACAAGAA TCGCCTGCTA CTGTTGTCTT CCGTCCGCCC GCGGATAATA
 2041 CCGACGGAGG AGCAGCAGCA GCAGCAGGAG GAAGCCAGGC GCGCGCGGCA GGAGCAGAGC
 2101 CCATGGAACC CGAGAGCCGG CCTGGACCCT CGGGAATGAA TGTGTACAG GTGGCTGAAC
 2161 TGTATCCAGA ACTGAGACGC ATTTTGACAA TTACAGAGGA TGGGCAGGGG CTAAGGGGGG
 2221 TAAAGAGGGA GCGGGGGGCT TGTGAGGCTA CAGAGGAGGC TAGGAATCTA GCTTTTAGCT
 2281 TAATGACCAG ACACCGTCCT GAGTGTTATTA CTTTTCAACA GATCAAGGAT AATTGCGCTA
 2341 ATGAGCTTGA TCTGCTGGCG CAGAAGTATT CCATAGAGCA GCTGACCACT TACTGGCTGC
 2401 AGCCAGGGGA TGATTTTGAG GAGGCTATTA GGGTATATGC AAAGGTGGCA CTTAGGCCAG

kd3

FIGURE 23
(SHEET 1)

45/66

1

```

2461 ATTGCAAGTA CAAGATCAGC AAACCTGTAA ATATCAGGAA TTGTTGCTAC ATTTCTGGGA
2521 ACGGGGCCGA GGTGGAGATA GATACGGAGG ATAGGGTGCG CTTTAGATGT AGCATGATAA
2581 ATATGTGGCC GGGGGTGCTT GGCATGGACG GGGTGGTTAT TATGAATGTA AGGTTTACTG
2641 GCCCAATTT TAGCGGTACG GTTTTCCTGG CCAATACCAA CCTTATCCTA CACGGTGTAA
2701 GCTTCTATGG GTTTAACAAT ACCTGTGTGG AAGCCTGGAC CGATGTAAGG GTTCGGGGCT
2761 GTGCCTTTTA CTGCTGCTGG AAGGGGGTGG TGTGTCGCCC CAAAAGCAGG GCTTCAATTA
2821 AGAAATGCCT CTTTGAAAGG TGTACCTTGG GTATCCTGTC TGAGGGTAAC TCCAGGGTGC
2881 GCCACAATGT GGCTCCGAC TGTGGTTGCT TCATGCTAGT GAAAAGCGTG GCTGTGATTA
2941 AGCATAACAT GGTATGTGGC AACTGCGAGG ACAGGGCCTC TCAGATGCTG ACCTGCTCGG
3001 ACGGCAACTG TCACCTGCTG AAGACCATTG ACGTAGCCAG CCACTCTCGC AAGGCCTGGC
3061 CAGTGTTTGA GCATAACATA CTGACCCGCT GTTCCTTGCA TTTGGGTAAC AGGAGGGGGG
3121 TGTTCCTACC TTACCAATGC AATTTGAGTC AACTAAGAT ATTGCTTGAG CCCGAGAGCA
3181 TGTCCAAGGT GAACCTGAAC GGGGTGTTTG ACATGACCAT GAAGATCTGG AAGGTGCTGA
3241 GGTACGATGA GACCCGCACC AGGTGCAGAC CCGCGAGTG TGCGGGTAAA CATATTAGGA
3301 ACCAGCCTGT GATGCTGGAT GTGACCGAGG AGCTGAGGCC CGATCACTTG GTGCTGGCCT
3361 GCACCCGCGC TGAGTTTGGC TCTAGCGATG AAGATACAGA TTGAGGTACT GAAATGTGTG
3421 GCGGTGGCTT AAGGGTGGGA AAGAATATAT AAGGTGGGGG TCTTATGTAG TTTTGTATCT
3481 GTTTTGACAG AGCCCGCGCC GCCATGAGCA CCAACTCGTT TGATGGAAGC ATTGTGAGCT
3541 CATATTTGAC AACCGCGATG CCCCCATGGG CCGGGGTGCG TCAGAATGTG ATGGGCTCCA
3601 GCATTGATGG TCGCCCCGTC CTGCCCGCAA ACTCTACTAC CTGACCTAC GAGACCGTGT
3661 CTGGAACGCC GTTGAGACT GCAGCCTCCG CCGCCGCTTC AGCCGCTGCA GCCACCGCCC
3721 GCGGGATTGT GACTGACTTT GCTTTCCTGA GCCCGCTTGC AAGCAGTGCA GCTTCCCGTT
3781 CATCCGCCCC CGATGACAAG TTGACGGCTC TTTTGGCACA ATTGGATTCT TTGACCCGGG
3841 AACTTAATGT CGTTTCTCAG CAGCTGTTGG ATCTGCGCCA GCAGGTTTCT GCCCTGAAGG
3901 CTTCTCCCCC TCCCAATGCG GTTTAAAACA TAAATAAAAA ACCAGACTCT GTTTGGATTT
3961 GGATCAAGCA AGTGTCTTGC TGTCTTTATT TAGGGGTTTT GCGCGCGCGG TAGGCCCGGG
4021 ACCAGCGGTC TCGGTGCTTG AGGGTCGTTG GTATTTTTTC CAGGACGTGG TAAAGGTGAC
4081 TCTGGATGTT CAGATACATG GGCATAAGCC CGTCTCTGGG GTGGAGGTAG CACCACTGCA
4141 GAGCTTCATG CTGCGGGGTG GTGTTGTAGA TGATCCAGTC GTAGCAGGAG CGCTGGGCGT
4201 GGTGCCTAAA AATGTCTTTC AGTAGCAAGC TGATTGCCAG GGGCAGGCCC TTGGTGTAAG
4261 TGTTTACAAA GCGGTAAAGC TGGGATGGGT GCATACGTGG GGATATGAGA TGCATCTTGG
4321 ACTGTATTTT TAGGTTGGCT ATGTTCCAG CCATATCCCT CCGGGGATTC ATGTTGTGCA
4381 GAACCACCAG CACAGTGTAT CCGGTGCACT TGGGAAATTT GTCATGTAGC TTAGAAGGAA
4441 ATGCGTGGAA GAACCTGGAG ACGCCCTTGT GACCTCCAAG ATTTTCCATG CATTCGTCCA
4501 TAATGATGGC AATGGGCCCA CGGGCGCGCG CCTGGGCGAA GATATTTCTG GGATCACTAA
4561 CGTCATAGTT GTGTTCCAGG ATGAGATCGT CATAGGCCAT TTTTACAAAG CGCGGGCGGA
4621 GGGTGCCAGA CTGCGGTATA ATGGTTCCAT CCGGCCCAGG GGCGTAGTTA CCCTCACAGA
4681 TTTGCATTTT CCACGCTTTC AGTTCAGATG GGGGGATCAT GTCTACCTGC GGGGCGATGA
4741 AGAAAACGGT TTCCGGGGTA GGGGAGATGA GCTGGGAAGA AAGCAGGTTT CTGACGAGCT
4801 GCGACTTACC GCAGCCGCTG GGCCCCGTAAA TCACACCTAT TACCGGGTGC AACTGGTAGT
4861 TAAGAGAGCT GCAGCTGCCG TCATCCCTGA GCAGGGGGGC CACTTCGTTA AGCATGTCCC
4921 TGAATCGCAT GTTTTCCCTG ACCAAATCCG CCAGAAGGCG CTCGCCGCC AGCGATAGCA
4981 GTTCTTGCAA GGAAGCAAAG TTTTTCACAG GTTTGAGACC GTCCGCCGTA GGCATGCTTT
5041 TGAGCGTTTG ACCAAGCAGT TCCAGGCGGT CCCACAGCTC GGTACCTGCT TCTACGGCAT
5101 CTCGATCCAG CATATCTCCT CGTTTCGCGG GTTGGGGCGG CTTTCGCTGT ACGGCAGTAG
5161 TCGGTGCTCG TCCAGACGGG CCAGGGTCAT GTCTTTCCAC GGGCGCAGGG TCCTCGTCAG
5221 CGTAGTCTGG GTACCGGTGA AGGGGTGCGC TCCGGGCTGC GCGCTGGCCA GGGTGCCTT
5281 GAGGCTGGTC CTGCTGGTGC TGAAGCGCTG CCGGTCTTCG CCCTGCGCGT CGGCCAGGTA
5341 GCATTTGACC ATGGTGTGAT AGTCCAGCCC CTCCGCGGCG TGGCCCTTGG CGCGCAGCTT
5401 GCCCTTGGAG GAGGCGCCGC ACGAGGGGCA GTGCAGACTT TTGAGGGCGT AGAGCTTGGG
5461 CGCGAGAAAT ACCGATTCCG GGGAGTAGCG ATCCGCGCCG CAGGCCCCCG AGACGGTCTC
5521 GCATTCCACG AGCCAGGTGA GCTCTGGCCG TTCGGGGTCA AAAACCAGGT TTCCCCCATG
5581 CTTTTTGATG CGTTTCTTAC CTCTGGTTTC CATGAGCCGG TGTCCACGCT CGGTGACGAA
5641 AAGGCTGTCC GTGTCCCCGT ATACAGACTT GAGAGGCCTG TCCTCGAGCG GTGTTCCCGG
5701 GTCCTCCTCG TATAGAAACT CGGACCACTC TGAGACAAAG GCTCGCGTCC AGGCCAGCAC
5761 GAAGGAGGCT AAGTGGGAGG GGTAGCGGTC GTTGTCCACT AGGGGGTCCA CTCGCTCCAG
5821 GGTGTGAAGA CACATGTGCG CCTCTTCGGC ATCAAGGAAG GTGATTGGTT TGTAGGTGTA

```

FIGURE 23
(SHEET 2)

```

5881 GGCCACGTGA CCGGGTGTTC CTGAAGGGGG GCTATAAAAG GGGGTGGGGG CGCGTTCGTC
5941 CTCACCTCTCT TCCGCATCGC TGTCTGCGAG GGCCAGCTGT TGGGGTGAGT ACTCCCTCTG
6001 AAAAGCGGGC ATGACTTCTG CGCTAAGATT GTCAGTTTCC AAAAACGAGG AGGATTTGAT
6061 ATTCACCTGG CCCGCGGTGA TCCCTTTGAG GGTGGCCGCA TCCATCTGGT CAGAAAAGAC
6121 AATCTTTTTT TGTCAAGCT TGGTGGCAAA CGACCCGTAG AGGGCGTTGG ACAGCAACTT
6181 GGCGATGGAG CGCAGGGTTT GGTTTTTGTC GCGATCGGCG CGCTCCTTGG CCGCGATGTT
6241 TAGCTGCACG TATTGCGCGC CAACGCACCG CCATTGCGGA AAGACGGTGG TGCCTCGTC
6301 GGGCACCAGG TGCACGCGCC AACCGCGGTT GTGCAGGGTG ACAAGGTCAA CGCTGGTGGC
6361 TACCTCTCCG CGTAGGCGCT CGTTGGTCCA GCAGAGGCGG CCGCCCTTGC GCGAGCAGAA
6421 TGGCGGTAGG GGGTCTAGCT GCGTCTCGTC CGGGGGGTCT GCGTCCACGG TAAAGACCCC
6481 GGGCAGCAGG CGCGCGTCGA AGTAGTCTAT CTTGCATCCT TGCAAGTCTA GCGCCTGCTG
6541 CCATGCGCGG GCGGCAAGCG CGCGCTCGTA TGGGTTGAGT GGGGGACCCC ATGGCATGGG
6601 GTGGGTGAGC GCGGAGGCGT ACATGCCGCA AATGTCGTAA ACGTAGAGGG GCTCTCTGAG
6661 TATTCCAAGA TATGTAGGGT AGCATCTTCC ACCGCGGATG CTGGCGCGCA CGTAATCGTA
6721 TAGTTCGTGC GAGGGAGCGA GGAGGTCGGG ACCGAGGTTG CTACGGGCGG GCTGCTCTGC
6781 TCGGAAGACT ATCTGCCTGA AGATGGCATG TGAGTTGGAT GATATGGTTG GACGCTGGAA
6841 GCGTTGGAAG CTGGCGTCTG TGAGACCTAC CGCGTCACGC ACGAAGGAGG CGTAGGATC
6901 GCGCAGCTTG TTGACCAGCT CGGCGGTGAC CTGCACGCTC AGGGCGCAGT AGTCCAGGGT
6961 TTCCTTGATG ATGTCATACT TATCCTGTCC CTTTTTTTTT CACAGCTCGC GGTGAGGAC
7021 AAACCTCTTC CGGTCTTTCC AGTACTCTTG GATCGGAAAC CCGTCGGCCT CCGAACGGTA
7081 AGAGCCTAGC ATGTAGAACT GGTGACGGC CTGGTAGGCG CAGCATCCCT TTTCTACGGG
7141 TAGCGCGTAT GCCTGCGCGG CCTTCCGGAG CGAGGTGTGG GTGAGCGCAA AGGTGTCCCT
7201 GACCATGACT TTGAGGTACT GGTATTTGAA GTCAGTGTCC TCGCATCCCG CTTGCTCCCA
7261 GAGCAAAAAG TCCGTGCGCT TTTTGGAAAC CGGATTTGGC AGGGCGAAGG TGACATCGTT
7321 GAAGAGTATC TTTCCGCGC GAGGCATAAA GTTGCCTGTG ATGCGGAAGG GTCCCGGCAC
7381 CTCGGAACCG TTGTTAAATTA CCTGGGCGGC GAGCACGATC TCGTCAAAGC CGTTGATGTT
7441 GTGGCCCCA ATGTAAAGTT CCAAGAAGCG CGGGATGCCC TTGATGGAAG GCAATTTTTT
7501 AAGTTCCTCG TAGGTGAGCT CTTCAGGGGA GCTGAGCCCG TGCTCTGAAA GGGCCAGTC
7561 TGCAAGTAGA GGGTTGGAAG CGACGAATGA GCTCCACAGG TCACGGGCCA TTAGCATTTG
7621 CAGGTGGTCG CGAAAGGTCC TAAACTGGCG ACCTATGGCC ATTTTTTCTG GGGTGATGCA
7681 GTAGAAGGTA AGCGGGTCTT GTTCCCAGCG GTCCCATCCA AGGTTGCGCG CTAGGTCTCG
7741 CGCGGCAGTC ACTAGAGGCT CATCTCCGCC GAAC TTCATG ACCAGCATGA AGGGCAGAG
7801 CTGCTTCCCA AAGGCCCCCA TCCAAGTATA GGTCTCTACA TCGTAGGTGA CAAAGAGACG
7861 CTCGGTGCGA GGATGCGAGC CGATCGGGA GAACTGGATC TCCCGCCACC AATTGGAGGA
7921 GTGGCTATTG ATGTGGTGAA AGTAGAAGTC CCTGCGACGG GCCGAACACT CGTGTGGCT
7981 TTTGTAAAAA CGTGCGCAGT ACTGGCAGCG GTGCACGGC TGACATCCT GCACGAGTT
8041 GACCTGACGA CCGCGCACAA GGAAGCAGAG TGGGAATTTG AGCCCTCGC CTGGCGGGTT
8101 TGGCTGGTGG TCTTCTACTT CGGCTGCTTG TCCTTGACCG TCTGGCTGCT CGAGGGGAGT
8161 TACGGTGGAT CGGACCACCA CGCCGCGCGA GCCCAAAGTC CAGATGTCCG CGCGCGCGCG
8221 TCGGAGCTTG ATGACAACAT CGCGCAGATG GGAGCTGTCC ATGGTCTGGA GCTCCCGCGG
8281 CGTCAGGTCA GCGGGGAGCT CCTGCAAGTT TACCTCGCAT AGACGGGTCA GGGCGCGGGC
8341 TAGATCCAGG TGATACCTAA TTTCCAGGGG CTGGTTGGTG GCGGCGTCGA TGGCTTGCAA
8401 GAGGCCGCAT CCCCGCGCGC CGACTACGGT ACCGCGCGGC GGGCGGTGGG CCGCGGGGGT
8461 GTCCTTGATG ATGCATCTA AAAGCGGTGA CGCGGGCGAG CCCCCGAGG TAGGGGGGGC
8521 TCCGGACCCG CCGGGAGAGG GGGCAGGGGC ACGTCGGC GC CGCGCGCGGG CAGGAGCTGG
8581 TGCTGCGCGC GTAGGTTGCT GGCGAACGCG ACGACGCGGC GGTGATCTC CTGAATCTGG
8641 CGCCTCTGCG TGAAGACGAC GGGCCCGGTG AGCTTGAGCC TGAAGAGAG TTCGACAGAA
8701 TCAATTTTCG TGTCGTTGAC GCGGCGCTGG CGCAAAATCT CCTGCACGTC TCCTGAGTTG
8761 TCTTGATAGG CGATCTCGGC CATGAACTGC TCGATCTCTT CCTCCTGGAG ATCTCCGCGT
8821 CCGGCTCGCT CCACGGTGGC GCGGAGGTCG TTGGAAATGC GGGCCATGAG CTGCGAGAAG
8881 GCGTTGAGGC CTCCCTCGTT CCAGACGCGG CTGTAGACCA CGCCCCCTTC GGCATCGCGG
8941 GCGCGCATGA CCACCTGCGC GAGATTGAGC TCCACGTGCC GGGCGAAGAC GGCCTAGTTT
9001 CGCAGGCGCT GAAAGAGGTA GTTGAGGGTG GTGGCGGTGT GTTCTGCCAC GAAGAAGTAC
9061 ATAACCCAGC GTCGCAACGT GGTTCGTTG ATATCCCCCA AGGCCTCAAG GCGCTCCATG
9121 CCCTCGTAGA AGTCCACGGC GAAGTTGAAA AACTGGGAGT TGCGCGCCGA CACGGTTAAC
9181 TCCTCTCCA GAAGACGGAT GAGCTCGGCG ACGTGTGCG GCACCTCGCG CTCAAAGGCT
9241 ACAGGGGCCT CTTCTTCTTC TTCAATCTCC TCTTCCATAA GGGCCTCCCC TTCTTCTTCT

```

```

9301 TCTGGCGGCG GTGGGGGAGG GGGGACACGG CGGCGACGAC GGGCGACCGG GAGGCGGTCTG
9361 ACAAAGCGCT CGATCATCTC CCCGCGGCGA CGGCGCATGG TCTCGGTGAC GGGCGGGCCG
9421 TTCTCCGCGG GCGCGAGTTG GAAGACGCCG CCCGTCATGT CCCGGTTATG GGTGCGCGGG
9481 GGGCTGCCAT GCGGCAGGGA TACGGCGCTA ACGATGCATC TCAACAATTG TTGTGTAGGT
9541 ACTCCGCCGC CGAGGGACCT GAGCGAGTCC GCATCGACCG GATCGGAAAA CCTCTCGAGA
9601 AAGGCCTCTA ACCAGTCACA GTCGCAAGGT AGGCTGAGCA CCGTGGCGGG CGGCAGCGGG
9661 CGGCGGTCCG GGTGTTTTCT GCGCGAGGTG CTGCTGATGA TGTAAITAAA GTAGGCGGTCT
9721 TTGAGACGGC GGATGGTCTA CAGAAGCACC ATGTCCCTGG GTCCGGCCTG CTGAAATGCGC
9781 AGGCGGTCCG CCATGCCCCA GGCTTCGTTT TGACATCGGC GCAGGTCTTT GTAGTAGTCT
9841 TGCATGAGCC TTTCTACCGG CACTTCTTCT TCTCCTTCCT CTTGTCTGTC ATCTCTTGCA
9901 TCTATCGCTG CCGCGCGCGC GGAGTTTGGC CGTAGGTGGC GCCCTCTTCC TCCCATGCGT
9961 GTGACCCCGA AGCCCCTCAT CGGCTGAAGC AGGGCTAGGT CGGCGACAAC GCGCTCGGCT
10021 AATATGGCCT GCTGCACCTG CGTGAGGGTA GACTGGAAGT CATCCATGTC CACAAAGCGG
10081 TGGTATGCGC CCGTGTGAT GGTGTAAGTG CAGTTGGCCA TAACGGACCA GTTAACGGTC
10141 TGGTGACCCG GCTGCGAGAG CTCGGTGTAC CTGAGACGCG AGTAAGCCCT CGAGTCAAAT
10201 ACGTAGTCTG TGCAAGTCCG CACCAGGTAC TGGTATCCCA CCAAAAAGTG CGGCGGCGGC
10261 TGGCGGTAGA GGGGCCAGCG TAGGGTGGCC GGGGCTCCGG GGGCGAGATC TTCCAACATA
10321 AGGCGATGAT ATCCGTAGAT GTACCTGGAC ATCCAGGTGA TGCCGGCGGC GGTGGTGGAG
10381 GCGCGCGGAA AGTCGCGGAC GCGGTTCCAG ATGTTGCGCA GCGGCAAAAA GTGCTCCATG
10441 GTCGGGACGC TCTGGCCGGT CAGGCGCGCG CAATCGTTGA CGCTCTAGCG TGCAAAAGGA
10501 GAGCCTGTAA GCGGGCACTC TTCCGTGGTG TGGTGGATAA ATTGCAAGG GTATCATGGC
10561 GGACGACCGG GGTTCGAGCC CCGTATCCGG CCGTCCGCGG TGATCCATGC GGTACCAGCC
10621 CGCGTGTCTG ACCCAGGTGT GCGACGTCAG ACAACGGGGG AGTGCTCCTT TTGGCTTCCT
10681 TCCAGGCGCG GCGGCTGCTG CGCTAGCTTT TTTGGCCACT GGCCGCGCGC AGCGTAAGCG
10741 GTTAGGCTGG AAAGCGAAAG CATTAAAGTG CTCGCTCCCT GTAGCCGGAG GGTATTTTC
10801 CAAGGGTTGA GTCGCGGGAC CCCCCTTCG AGTCTCGGAC CGGCCGGACT GCGGCGAACG
10861 GGGGTTTGCC TCCCCTCAT GCAAGACCCC GCTTGCAAAT TCCTCCGAA ACAGGGACGA
10921 GCCCCTTTTT TGCTTTTCCC AGATGCATCC GGTGCTGCGG CAGATGCGCC CCCCTCCTCA
10981 GCAGCGGCAA GAGCAAGAGC AGCGGCAGAC ATGCAGGGCA CCTCCCCTC CTCCTACCGC
11041 GTCAGGAGGG GCGACATCCG CGGTTGACGC GGCAGCAGAT GGTGATTACG AACCCCCGCG
11101 GCGCCGGGCC CGGCACTACC TGGACTTGGA GGAGGGCGAG GGCTGGCGC GGCTAGGAGC
11161 GCCCTCTCCT GAGCGGTACC CAAGGGTGCA GCTGAAGCGT GATACGCGTG AGGCGTACGT
11221 GCGCGGCGAG AACCTGTTTC GCGACCGCGA GGGAGAGGAG CCCGAGGAGA TGCGGGATCG
11281 AAAGTTCCAC GCAGGGCGCG AGCTGCGGCA TGGCCTGAAT CGCGAGCGGT TGCTGCGCGA
11341 GGAGGACTTT GAGCCCGACG CGCGAACCGG GATTAGTCCC GCGCGCGCAC ACGTGGCGGC
11401 GCGCGACCTG GTAACCGCAT ACGAGCGAGC GGTGAACCAG GAGATTAACT TTCAAAAAG
11461 CTTTAACAAC CACGTGCGTA CGCTTGTTGGC GCGCGAGGAG GTGGCTATAG GACTGATGCA
11521 TCTGTGGGAC TTTGTAAGCG CGCTGGAGCA AAACCCAAAT AGCAAGCCGC TCATGGCGCA
11581 GCTGTTCTCT ATAGTGCAGC ACAGCAGGGA CAACGAGGCA TTCAGGGATG CGCTGCTAAA
11641 CATAGTAGAG CCCGAGGGCC GCTGGCTGCT CGATTTGATA AACATCCTGC AGAGCATAGT
11701 GGTGCAGGAG CGCAGCTTGA GCCTGGCTGA CAAGGTGGCC GCCATCACT ATTCCATGCT
11761 TAGCCTGGGC AAGTTTTACG CCCGCAAGAT ATACCATAAC CTTACGTTT CCATAGACAA
11821 GGAGGTAAAG ATCGAGGGGT TCTACATGCG CATGGCGCTG AAGGTGCTTA CCTTGAGCGA
11881 CGACCTGGGC GTTTATCGCA ACGAGCGCAT CCACAAGGCC GTGAGCGTGA GCCGGCGGCG
11941 CGAGCTCAGC GACCGCGAGC TGATGCACAG CCTGCAAAGG GCCTGGCTG GCACGGGCAG
12001 CGGCGATAGA GAGGCCGAGT CCTACTTTGA CGCGGGCGCT GACCTGCGCT GGGCCCCAAG
12061 CCGACGCGCC CTGGAGGCGA CTGGGGCCGG ACCTGGGCTG GCGGTGGCAC CCGCGCGCGC
12121 TGGCAACGTC GCGGCGGTGG AGGAATATGA CGAGGACGAT GAGTACGAGC CAGAGGACGG
12181 CGAGTACTAA GCGGTGATGT TTCTGATCAG ATGATGCAAG ACGCAACGGA CCCGGCGGTG
12241 CGGGCGGCGC TGCAGAGCCA GCCGTCCGGC CTTAACTCCA CGGACGACTG GCGCCAGGTC
12301 ATGGACCGCA TCATGTCGCT GACTGCGCGC AATCCTGACG CGTTCGGCA GCAGCCGCGC
12361 GCCAACCGGC TCTCGCAAT TCTGGAAGCG GTGGTCCCGG CGCGCGCAAA CCCACGCGC
12421 GAGAAGGTGC TGGCGATCGT AAACGCGCTG GCCGAAAACA GGGCCATCCG GCCCGACGAG
12481 GCGGCGCTGG TCTACGACGC GCTGCTTCAG CGCGTGGCTC GTTACAACAG CGGCAACGTG
12541 CAGACCAACC TGGACCGGCT GGTGGGGGAT GTGCGCGAGG CCGTGGCGCA GCGTGAGCGC
12601 GCGCAGCAGC AGGGCAACCT GGGCTCCATG GTTGCACTAA ACGCCTTCCT GAGTACACAG
12661 CCCGCCAACG TGCCGCGGGG ACAGGAGGAC TACACCAACT TTGTGAGCGC ACTGCGGCTA

```

```

12721 ATGGTGACTG AGACACCGCA AAGTGAGGTG TACCAGTCTG GGCCAGACTA TTTTTCCTCAG
12781 ACCAGTAGAC AAGGCCTGCA GACCGTAAAC CTGAGCCAGG CTTTCAAAAA CTTGCAGGGG
12841 CTGTGGGGGG TGCGGGCTCC CACAGGCGAC CGCGCGACCG TGTCTAGCTT GCTGACGCCC
12901 AACTCGCGCC TGTGTCTGCT GCTAATAGCG CCCTTCACGG ACAGTGGCAG CGTGTCCCGG
12961 GACACATACC TAGGTCACCT GCTGACACTG TACCGCGAGG CCATAGGTCA GGCGCATGTG
13021 GACGAGCATA CTTTCCAGGA GATTACAAGT GTCAGCCGCG CGCTGGGGCA GGAGGACACG
13081 GGCAGCCTGG AGGCAACCCT AAACCTACCTG CTGACCAACC GGCGGCAGAA GATCCCTCTG
13141 TTGCACAGTT TAAACAGCGA GGAGGAGCGC ATTTTGCCTG ACGTGCAGCA GAGCGTGAGC
13201 CTTAACCTGA TGCGCGACGG GGTAAACGCC AGCGTGGCGC TGGACATGAC CGCGCGCAAC
13261 ATGGAACCGG GCATGTATGC CTCAAACCGG CCGTTTATCA ACCGCCTAAT GGACTACTTG
13321 CATCGCGCGG CCGCCGTGAA CCCCAGATAT TTCACCAATG CCATCTTGAA CCCGCACTGG
13381 CTACCGCCCC CTGGTTTCTA CACCGGGGGA TTCAGAGGTG CCGAGGGTAA CGATGGATTG
13441 CTCTGGGACG ACATAGACGA CAGCGTGTTC TCCCCGCAAC CGCAGACCTT GCTAGAGTTG
13501 CAACAGCGCG AGCAGGCAGA GGCGGCGCTG CGAAAGGAAA GCTTCCGCAG GCCAAGCAGC
13561 TTGTCCGATC TAGGCGCTGC GGCCCCGCGG TCAGATGCTA GTAGCCCAT TCCAAGCTTG
13621 ATAGGTCTC TTACCAGCAC TCGCACCAAC CGCCCGCGCC TGCTGGGCGA GGAGGAGTAC
13681 CTAAACAAC CTGCTCTGCA GCCGAGCGC GAAAAAAACC TGCCTCCGGC ATTTCCCAAC
13741 AACGGGATAG AGAGCCTAGT GGACAAGATG AGTAGATGGA AGACGTACGC GCAGGAGCAC
13801 AGGGACGTGC CAGGCCCGCG CCCGCCACCC CGTCGTCAA GGCACGACCG TCAGCGGGGT
13861 CTGGTGTGGG AGGACGATGA CTCGGCAGAC GACAGCAGCG TCCTGGATTT GGGAGGGAGT
13921 GGCAACCCGT TTGCGCACCT TCGCCCCAGG CTGGGGAGAA TGTTTTAAAA AAAAAAAGC
13981 ATGATGCAAA ATAAAAAACT CACCAAGGCC ATGGCACCGA GCGTTGGTTT TCTTGTATTC
14041 CCCTTAGTAT GCGGCGCGCG GCGATGTATG AGGAAGGTCC TCCTCCCTCC TACGAGAGTG
14101 TGGTGAGCGC GCGGCCAGTG GCGGCGCGCG TGGGTCTCC CTTCGATGCT CCCCTGGACC
14161 CGCCCTTTGT GCCTCCGCGG TACCTGCGGC CTACCGGGGG GAGAAACAGC ATCCCTTACT
14221 CTGAGTTGGC ACCCTTATTC GACACCACCC GTGTGTACCT GGTGGACAAC AAGTCAACGG
14281 ATGTGGCATC CCTGAACCTAC CAGAACGACC ACAGCAACTT TCTGACCAGC GTCATTCAAA
14341 ACAATGACTA CAGCCCGGGG GAGGCAAGCA CACAGACCAT CAATCTTGAC GACCCGTGCG
14401 ACTGGGCGCG CGACCTGAAA ACCATCCTGC ATACCAACAT GCCAAATGTG AACGAGTTCA
14461 TGTTTACCAA TAAGTTTAAG GCGCGGGTGA TGGTGTGCGG CTTGCCTACT AAGGACAATC
14521 AGGTGGAGCT GAAATACGAG TGGGTGGAGT TCACGCTGCC CGAGGGCAAC TACTCCGAGA
14581 CCATGACCAT AGACCTTATG AACACGCGA TCGTGGAGCA CTACTTGAAA GTGGGCAGAC
14641 AGAACGGGGT TCTGGAAGGC GACATCGGGG TAAAGTTTGA CACCCGCAAC TTCAGATGG
14701 GGTTCGACCC CGTCACTGGT CTTGTCTATG CTGGGGTATA TACAAACGAA GCCTTCCATC
14761 CAGACATCAT TTTGCTGCCA GGATGCGGGG TGGACTTCAC CCACAGCCGC CTGAGCAACT
14821 TGTGGGCAT CCGCAAGCGG CAACCTTCC AGGAGGGCTT TAGGATCACC TACGATGATC
14881 TGGAGGGTGG TAACATTCCC GCACTGTTGG ATGTGGACGC CTACCAGCGG AGCTTGAAAG
14941 ATGACACCGA ACAGGCGGGG GGTGGCGCAG GCGGCAGCAA CAGCAGTGGC AGCGGCGCGG
15001 AAGAGAACTC CAACGCGGCA GCCGCGGCAA TGCAGCCGGT GGAGGACATG AACGATCATG
15061 CCATTGCGCG CGACACCTTT GCCACACGGG CTGAGGAGAA GCGCGCTGAG GCCGAAGCAG
15121 CGGCCGAAGC TGCCGCCCCC GCTGCGCAAC CCGAGGTCGA GAAGCCTCAG AAGAAACCGG
15181 TGATCAAACC CCTGACAGAG GACAGCAAGA AACGCAGTTA CAACCTAATA AGCAATGACA
15241 GCACCTTCAC CCAGTACCGC AGCTGGTACC TTGCATACAA CTACGGCGAC CCTCAGACCG
15301 GAATCCGCTC ATGGACCCTG CTTTGCACTC CTGACGTAAC CTGCGGCTCG GAGCAGGTCT
15361 ACTGGTCGTT GCCAGACATG ATGCAAGACC CCGTGACCTT CCGCTCCACG CGCCAGATCA
15421 GCAACTTTCC GGTGGTGGGC GCCGAGCTGT TGCCCGTGCA CTCCAAGAGC TTCTACAACG
15481 ACCAGGCGCT CTACTCCCAA CTCATCCGCG AGTTTACCTC TCTGACCCAC GTGTTCAATC
15541 GCTTTCCCGA GAACCAGATT TTGGCGCGCC CGCCAGCCCC CACCATCACC ACCGTCAGTG
15601 AAAACGTTCC TGCTCTACA GATCACGGGA CGCTACCGCT GCGCAACAGC ATCGGAGGAG
15661 TCCAGCGAGT GACCATTAAT GACGCCAGAC GCGGCACCTG CCCCTACGTT TACAAGGCCC
15721 TGGGCATAGT CTCGCCGCGC GTCCTATCGA GCCGCACTTT TTGAGCAAGC ATGTCCATCC
15781 TTATATCGCC CAGCAATAAC ACAGGCTGGG GCCTGCGCTT CCCAAGCAAG ATGTTTGGCG
15841 GGGCCAGAA GCGCTCCGAC AACACCCAG TGCGCGTGCG CGGGCACTAC CGCGCGCCCT
15901 GGGGCGCGCA CAAACGCGGC CGCACTGGGC GCACCACCGT CGATGACGCC ATCGACGCGG
15961 TGGTGGAGGA GGCGCGCAAC TACACGCCCA CGCCGCCACC AGTGTCCACA GTGGACGCGG
16021 CCATTCAAGC CGTGGTGCGC GGAGCCCGGC GCTATGCTAA AATGAAGAGA CGGCGGAGGC
16081 GCGTAGCAGC TCGCCACCGC CGCCGACCCG GCACTGCCGC CCAACGCGCG GCGGCGGCCC

```

```

16141 TGCTTAACCG CGCACGTGCG ACCGGCCGAC GGGCGGCCAT GCGGGCCGCT CGAAGGCTGG
16201 CCGCGGGTAT TGTCACGTGT CCCCCAGGT CCAGGCGACG AGCGGCCGCC GCAGCAGCCG
16261 CGGCCATTAG TGCTATGACT CAGGGTCGCA GGGGCAACGT GTATTGGGTG CCGGACTCGG
16321 TTAGCGGCCT GCGCGTGCCC GTGCGCACCC GCGCCCCGCG CAACTAGATT GCAAGAAAAA
16381 ACTACTTAGA CTCGTACTGT TGTATGTATC CAGCGGCGGC GCGCGCAAC GAAGCTATGT
16441 CCAAGCGCAA AATCAAAGAA GAGATGCTCC AGGTCATCGC GCCGGAGATC TATGGCCCCC
16501 CGAAGAAGGA AGAGCAGGAT TACAAGCCCC GAAAGCTAAA GCGGGTCAAA AAGAAAAAGA
16561 AAGATGATGA TGATGAACTT GACGACGAGG TGGAACTGCT GCACGCTACC GCGCCCAGGC
16621 GACGGGTACA GTGGAAAGGT CGACGCGTAA AACGTGTTTT GCGACCCGGC ACCACCGTAG
16681 TCTTTACGCC CGGTGAGCGC TCCACCCGCA CCTACAAGCG CGTGTATGAT GAGGTGTACG
16741 GCGACGAGGA CCTGCTTGAG CAGGCCAACG AGCGCCTCGG GGAGTTTGCC TACGGAAAGC
16801 GGCATAAGGA CATGCTGGCG TTGCGCTGG ACAGGGGCAA CCCAACACCT AGCCTAAAGC
16861 CCGTAACACT GCAGCAGGTG CTGCCCCGCG TTGCACCGTC CGAAGAAAAG CGCGGCCTAA
16921 AGCGCGAGTC TGGTGACTTG GCACCCACCG TGCAGCTGAT GGTACCCAAG CGCCAGCGAC
16981 TGGAAGATGT CTTGAAAAAA ATGACCGTGG AACCTGGGCT GGAGCCCGAG GTCCGCGTGC
17041 GGCCAATCAA GCAGGTGGCG CCGGGACTGG GCGTGACGAC CGTGGACGTT CAGATACCCA
17101 CTACCAAGTAG CACCAGTATT GCCACCGCCA CAGAGGGCAT GGAGACACAA ACGTCCCCGG
17161 TTGCTCAGC GGTGGCGGAT GCCGCGGTGC AGGCGGTGCG TCGGGCCGCG TCCAAGACCT
17221 CTACGGAGGT GCAAACGGAC CCGTGGATGT TTCGCGTTTC AGCCCCCGCG CGCCCCGCGC
17281 GTTCGAGGAA GTACGGCGCC GCCAGCGCGC TACTGCCCGA ATATGCCCTA CATCCTTCCA
17341 TTGCGCCTAC CCCCGGCTAT CGTGGCTACA CCTACCGCCC CAGAAGACGA GCAACTACCC
17401 GACGCGGAAC CACCACTGGA ACCGCGCGCC GCGTCCGCGG TCGCCAGCCC GTGCTGCCCC
17461 CGATTTCGT GCGCAGGGTG GTCGCGAAG GAGGCAGGAC CCTGGTGCTG CCAACAGCGC
17521 GCTACCACCC CAGCATCGTT TAAAAGCCGG TCTTTGTGGT TCTTGAGAT ATGGCCCTCA
17581 CCTGCCGCT CCGTTTCCCG GTGCGGGGAT TCCGAGGAAG AATGCACCGT AGGAGGGGCA
17641 TGGCCGGCCA CGGCCTGACG GCGCGCATGC GTCGTGCGCA CCACCGGCGG CGGCGCGCGT
17701 CGCACCGTCG CATGCGCGGC GGTATCCTGC CCCTCCTTAT TCCACTGATC GCCGCGGCGA
17761 TTGCGCGCGT GCCCGGAATT GCATCCGTGG CCTTGCAAGC GCAGAGACAC TGATTAATAA
17821 CAAGTTGCAT GTGGAAAAAT CAAAAATAAA AGTCTGGACT CTCACGCTCG CTGGTCTCTG
17881 TAACTATTTT GTAGAATGGA AGACATCAAC TTTGCGTCTC TGGCCCCGCG ACACGGCTCG
17941 CGCCCGTTCA TGGGAAACTG GCAAGATATC GGCACCAGCA ATATGAGCGG TGGCGCCTTC
18001 AGCTGGGGCT CGCTGTGGAG CGGCATTAAA AATTTGCGTT CCACCGTTAA GAACTATGGC
18061 AGCAAGGCCT GGAACAGCAG CACAGGCCAG ATGCTGAGGG ATAAGTTGAA AGAGCAAAAT
18121 TTCCAACAAA AGGTGGTAGA TGGCCTGGCC TCTGGCATTG GCGGGGTGGT GGACCTGGCC
18181 AACCAAGCAG TGCAAAATAA GATTAACAGT AAGCTTGATC CCCGCCCTCC CGTAGAGGAG
18241 CCTCCACCGG CCGTGAGAC AGTGTCTCCA GAGGGGCGTG GCGAAAAGCG TCCGCGCCCC
18301 GACAGGGAAG AAACCTCTGT GACGCAAATA GACGAGCCTC CCTCGTACGA GGAGGCACTA
18361 AAGCAAGGCC TGCCCACCAC CCGTCCCATC GCGCCCATGG CTACCGGAGT GCTGGGCCAG
18421 CACACACCCG TAACGCTGGA CCTGCCTCCC CCGCGCGACA CCCAGCAGAA ACCTGTGCTG
18481 CCAGGCCCCG CCGCGGTTGT TGTAACCCGT CCTAGCCGCG CGTCCCTGCG CCGCGCGGCC
18541 AGCGGTCCGC GATCGTTGCG GCCCGTAGCC AGTGGCAACT GGCAAAAGCA ACTGAACAGC
18601 ATCGTGGGTC TGGGGGTGCA ATCCCTGAAG CGCCGACGAT GCTTCTGAAT AGCTAACGTG
18661 TCGTATGTGT GTCATGTATG CGTCCATGTC GCCGCCAGAG GAGCTGCTGA GCCGCCGCGC
18721 GCCCGCTTTC CAAGATGGCT ACCCTTCGA TGATGCCGCA GTGGTCTTAC ATGCACATCT
18781 CGGGCCAGGA CGCCTCGGAG TACCTGAGCC CCGGGCTGGT GCAGTTTGCC CGCGCCACCG
18841 AGACGTACTT CAGCCTGAAT AACAAAGTTA GAAACCCAC GGTGGCGCCT ACGCACGACG
18901 TGACCACAGA CCGGTCCAG CGTTTGACG TGCGGTTTAT CCCTGTGGAC CGTGAGGATA
18961 CTGCGTACTC GTACAAGGCG CGGTTACACC TAGCTGTGGG TGATAACCGT GTGCTGGACA
19021 TGGCTTCCAC GTACTTTGAC ATCCGCGGCG TGCTGGACAG GGGCCCTACT TTTAAGCCCT
19081 ACTCTGGCAC TGCTTACAAC GCCCTGGCTC CCAAGGGTGC CCCAAATCCT TGCGAATGGG
19141 ATGAAGCTGC TACTGCTCTT GAAATAAACC TAGAAGAAGA GGACGATGAC AACGAAGACG
19201 AAGTAGACGA GCAAGCTGAG CAGCAAAAAA CTCACGTATT TGGGCAGGCG CCTTATTCTG
19261 GTATAAATAT TACAAAGGAG GGTATTCAAA TAGGTGTCGA AGGTCAAACA CTTAAATATG
19321 CCGATAAAAC ATTTCAACCT GAACCTCAAA TAGGAGAATC TCAGTGGTAC GAAACTGAAA
19381 TTAATCATGC AGCTGGGAGA GTCCTTAAAA AGACTACCCC AATGAAACCA TGTACGGTT
19441 CATATGCAAA ACCCACAAAT GAAATGGAG GGCAAGGCAT TCTTGTAAG CAACAAAATG
19501 GAAAGCTAGA AAGTCAAGTG GAAATGCAAT TTTTCTCAAC TACTGAGGCG ACCCGAGGCA

```

```

19561 ATGGTGATAA CTTGACTCCT AAAGTGGTAT TGTACAGTGA AGATGTAGAT ATAGAAACCC
19621 CAGACACTCA TATTTCTTAC ATGCCCACTA TTAAGGAAGG TAACTCACGA GAACTAATGG
19681 GCCAACAAATC TATGCCCAAC AGGCTTAATT ACATTGCTTT TAGGGACAAT TTTATTGGTC
19741 TAATGTATTA CAACAGCACG GGTAATATGG GTGTTCTGGC GGGCCAAGCA TCGCAGTTGA
19801 ATGCTGTTGT AGATTTGCAA GACAGAAACA CAGAGCTTTC ATACCAGCTT TTGCTTGATT
19861 CCATTGGTGA TAGAACCAGG TACTTTTCTA TGTGGAATCA GGCTGTTGAC AGCTATGATC
19921 CAGATGTTAG AATTATTGAA AATCATGGAA CTGAAGATGA ACTTCCAAAT TACTGCTTTC
19981 CACTGGGAGG TGTGATTAAT ACAGAGACTC TTACCAAGGT AAAACCTAAA ACAGGTCAGG
20041 AAAATGGATG GGAAAAAGAT GCTACAGAAT TTTCAGATAA AAATGAAATA AGAGTTGGAA
20101 ATAATTTTGC CATGGAAATC AATCTAAATG CCAACCTGTG GAGAAATTTT CTGTACTCCA
20161 ACATAGCGCT GTATTTGCCC GACAAGCTAA AGTACAGTCC TTCCAACGTA AAAATTTCTG
20221 ATAACCCAAA CACCTACGAC TACATGAACA AGCGAGTGGT GGCTCCCGGG TTAGTGGACT
20281 GCTACATTAA CCTTGAGACA CGCTGGTCCC TTGACTATAT GGACAACGTC AACCATTTA
20341 ACCACCACCG CAATGCTGGC CTGCGCTACC GCTCAATGTT GCTGGGCAAT GGTGCTATG
20401 TGCCCTTCCA CATCCAGGTG CCTCAGAAGT TCTTTGCCAT TAAAAACCTC CTTCCTCCTG
20461 CGGGCTCATA CACCTACGAG TGGAACTTCA GGAAGGATGT TAACATGGTT CTGCAGAGCT
20521 CCCTAGGAAA TGACCTAAGG GTTGACGGAG CCAGCATTAA GTTTGATAGC ATTTGCCTTT
20581 ACGCCACCTT CTTCCCCATG GCCACAACA CCGCTCCAC GCTTGAGGCC ATGCTTAGAA
20641 ACGACACCAA CGACCAGTCC TTTAACGACT ATCTCTCCGC CGCCAACATG CTCTACCCTA
20701 TACCCGCCAA CGCTACCAAC GTGCCCATAT CCATCCCTC CCGCAACTGG GCGGCTTTC
20761 GCGGCTGGGC CTTACGCGC CTTAAGACTA AGGAAACCCC ATCACTGGG CCGGCTTTC
20821 ACCCTTATTA CACCTACTCT GGCTCTATAC CCTACCTAGA TGGAACTTTT TACCTCAACC
20881 ACACCTTTAA GAAGGTGGCC ATTACCTTTG ACTCTTCTGT CAGCTGGCCT GGCAATGACC
20941 CCCTGCTTAC CCCCACGAG TTTGAAATTA AGCGCTCAGT TGACGGGGAG GGTTACAACG
21001 TTGCCCAGTG TAACATGACC AAAGACTGGT TCCTGGTACA AATGCTAGCT AACTACAACA
21061 TTGGCTACCA GGGCTTCTAT ATCCCAGAGA GCTACAAGGA CCGCATGTAC TCCTTCTTTA
21121 GAAACTTCCA GCCCATGAGC CGTCAGGTGG TGGATGATAC TAAATACAAG GACTACCAAC
21181 AGGTGGGCAT CCTACACCAA CACAACAAC CTGGATTTGT TGGCTACCTT GCCCCACCA
21241 TGCGCGAAGG ACAGGCCCTAC CCTGCTAACT TCCCCTATCC GCTTATAGGC AAGACCGCAG
21301 TTGACAGCAT TACCCAGAAA AAGTTTCTTT GCGATCGCAC CTTTGGCGC ATCCCATCTT
21361 CCAGTAACTT TATGTCCATG GGCGCACTCA CAGACCTGGG CCAAAACCTT CTCTACGCCA
21421 ACTCCGCCCA CGCGCTAGAC ATGACTTTTG AGGTGGATCC CATGGACGAG CCCACCCTTC
21481 TTTATGTTTT GTTTGAAGTC TTTGACGTGG TCCGTGTGCA CCGGCCGCAC CGCGGCGTCA
21541 TCGAAACCGT GTACCTGCGC ACGCCCTTCT CCGCCGGCAA CGCCACAACA TAAAGAAGCA
21601 AGCAACATCA ACAACAGCTG CCGCCATGGG CTCCAGTGAG CAGGAAGTGA AAGCCATTGT
21661 CAAAGATCTT GGTTGTGGGC CATATTTTTC GGGCACCTAT GACAAGCGCT TTCCAGGCTT
21721 TGTTTCTCCA CACAAGCTCG CCTGCGCCAT AGTCAATACG GCCGTCGCG AGACTGGGGG
21781 CGTACACTGG ATGGCCTTTG CCTGGAACCC GCACTCAAAA ACATGCTACC TCTTTGAGCC
21841 CTTTGGCTTT TCTGACCAGC GACTCAAGCA GGTTTACCAG TTGAGTACG AGTCACTCCT
21901 GCGCCGTAGC GCCATTGCTT CTCCCCCGA CCGCTGTATA ACGCTGAAA AGTCCACCCA
21961 AAGCGTACAG GGGCCCAACT CGGCCGCTG TGGACTATTC TGCTGCATGT TTCTCCACGC
22021 CTTTGCCAAC TGGCCCAAAA CTCCCCATGA TCACAACCCC ACCATGAACC TTATTACCGG
22081 GGTACCCAAC TCCATGCTCA ACAGTCCGGA GGTACAGCCC ACCCTGCGTC GCAACCAGGA
22141 ACAGCTCTAC AGCTTCTTGG AGCGCCACTC GCCCTACTTC CGCAGCCACA GTGCGCAGAT
22201 TAGGAGCGCC ACTTCTTTTT GTCACTTGAA AAACATGTAA AAATAATGTA CTAGAGACAC
22261 TTTCAATAAA GGCAAATGCT TTTATTTGTA CACTCTCGGG TGATTATTTA CCCCCACCCT
22321 TGCCGTCTGC GCCGTTTAAA AATCAAAGGG GTTCTGCCGC GCATCGCTAT GCGCCACTGG
22381 CAGGGACACG TTGCGATACT GGTGTTTAGT GCTCCACTTA AACTCAGGCA CAACCATCCG
22441 CGGCAGCTCG GTGAAGTTTT CACTCCACAG GCTGCGCACC ATCACCACG CGTTTAGCAG
22501 GTCGGGCGCC GATATCTTGA AGTCGCAGTT GGGGCCTCCG CCCTGCGCGC GCGAGTTGCG
22561 ATACACAGGG TTGCAGCACT GGAACACTAT CAGCGCCGGG TGGTGACGC TGGCCAGCAC
22621 GCTCTTGTCG GAGATCAGAT CCGCGTCCAG GTCCTCCGCG TTGCTCAGGG CGAACGGAGT
22681 CAACTTTGGT AGCTGCCTTC CCAAAAAGGG CGCGTGCCCA GGCTTTGAGT TGCACTCGCA
22741 CCGTAGTGGC ATCAAAGGT GACCGTGCCC GGTCTGGGCG TTAGGATACA GCGCCTGCAT
22801 AAAAGCCTTG ATCTGCTTAA AAGCCACCTG AGCCTTTGCG CTTTCAGAGA AGAACATGCC
22861 GCAAGACTTG CCGGAAAAC GATTGCGCGG ACAGGCGCG TCGTGACGC AGCACCTTGC
22921 GTCGGTGTGG GAGATCTGCA CCACATTTGC GCCCACCAGG TTCTTCACGA TCTTGGCCTT

```

```

22981 GCTAGACTGC TCCTTCAGCG CGCGCTGCCC GTTTTCGCTC GTCACATCCA TTTCAATCAC
23041 GTGCTCCTTA TTTATCATAA TGCTTCCGTG TAGACACTTA AGCTCGCCTT CGATCTCAGC
23101 GCAGCGGTGC AGCCACAACG CGCAGCCCGT GGGCTCGTGA TGCTTGTAGG TCACCTCTGC
23161 AAACGACTGC AGGTACGCCT GCAGGAATCG CCCCATCATC GTCACAAAGG TCTTGTGTCT
23221 GGTGAAGGTC AGCTGCAACC CGCGGTGCTC CTCGTTTCAGC CAGGTCTTGC ATACGGCCGC
23281 CAGAGCTTCC ACTTGGTCAG GCAGTAGTTT GAAGTTCGCC TTTAGATCGT TATCCACGTG
23341 GTACTTGTCC ATCAGCGCGC GCGCAGCCTC CATGCCCTTC TCCCACGCAG ACACGATCGG
23401 CACACTCAGC GGGTTCATCA CCGTAATTTT ACTTTCGCT TCGCTGGGCT CTTCTCTTTC
23461 CTCTTGCCTC CGCATACCAC GCGCCACTGG GTCGTCTTCA TTCAGCCGCC GCACTGTGCG
23521 CTTACCTCCT TTGCCATGCT TGATTAGCAC CGGTGGGTTG CTGAAACCCA CCATTTGTAG
23581 CGCCACATCT TCTCTTCTT CCTCGCTGTC CACGATTACC TCTGGTGATG GCGGGCGCTC
23641 GGGCTTGGGA GAAGGGCGCT TCTTTTCTT CTTGGGCGCA ATGGCCAAAT CCGCCGCCGA
23701 GGTCGATGGC CGCGGGCTGG GTGTGCGCGG CACCAGCGCG TCTTGTGATG AGTCTTCCTC
23761 GTCCTCGGAC TCGATACGCC GCCTCATCCG CTTTTTTGGG GCGCCCCGGG GAGGCGGCGG
23821 CGACGGGGAC GGGGACGACA CGTCTCCAT GGTGGGGGA CGTCGCGCGG CACCGCGTCC
23881 GCGCTCGGGG GTGGTTTCGC GCTGCTCCTC TTCCCGACTG GCCATTTCTT TCTCTATAG
23941 GCAGAAAAAG ATCATGGAGT CAGTCGAGAA GAAGGACAGC CTAACCGCCC CCTCTGAGTT
24001 CGCCACCACC GCCTCCACCG ATGCCGCCAA CGCGCCTACC ACCTTCCCGG TCGAGGCACC
24061 CCCGCTTGAG GAGGAGGAAG TGATTATCGA GCAGGACCCA GGTTTTGTA GCGAAGACGA
24121 CGAGGACCGC TCAGTACCAA CAGAGGATAA AAAGCAAGAC CAGGACAACG CAGAGGCAAA
24181 CGAGGAACAA GTCGGGCGGG GGGACGAAAG GCATGGCGAC TACCTAGATG TGGGAGACGA
24241 CGTGCTGTTG AAGCATCTGC AGCGCCAGTG CGCCATTATC TCGACGCGT TCGAAGAGCG
24301 CAGCGATGTG CCCCTCGCCA TAGCGGAGT CAGCCTTGCC TACGAACGCC ACCTATTCTC
24361 ACCGCGCGTA CCCCCCAAAC GCCAAGATAA CGGCACATGC GAGCCCAACC CGCGCCTCAA
24421 CTTCTACCCC GTATTGCGG TGCCAGAGGT GCTTGCCACC TATCACATCT TTTCCAAAAA
24481 CTGCAAGATA CCCCTATCCT GCCGTGCCAA CCGCAGCCGA GCGGACAAGC AGCTGGCCTT
24541 GCGGACGGG GCTGTCATAC CTGATATCGC CTCGCTCAAC GAAGTGCCAA AAATCTTTGA
24601 GGGTCTTGGA CGCGACGAGA AGCGCGCGGC AAACGCTCTG CAACAGGAAA ACAGCGAAAA
24661 TGAAAGTCAC TCTGGAGTGT TGGTGGAAT CGAGGGTGAC AACGCGCGCC TAGCCGTACT
24721 AAAACGCAGC ATCGAGGTCA CCCACTTTCG CTACCCGGCA CTTAACCTAC CCCCCAAGT
24781 CATGAGCACA GTCATGAGTG AGCTGATCGT GCGCCGTGCG CAGCCCTTGG AGAGGATGCG
24841 AAATTTGCAA GAACAAACAG AGGAGGGCCT ACCCGCAGTT GCGGACGAGC AGCTAGCGCG
24901 CTGGCTTCAA ACGCGCGAGC CTGCCGACTT GGAGGAGCGA CGCAAATAA TGATGGCCGC
24961 AGTGCTCGTT ACCGTGGAGC TTGAGTGAT GCAGCGGTTT TTTGCTGACC CGGAGATGCA
25021 GCGCAAGCTA GAGGAAACAT TGCACTACAC CTTTCGACAG GGCTACGTAC GCCAGGCCTG
25081 CAAGATCTCC AACGTGGAGC TCTGCAACCT GGTCTCCTAC CTTGGAATTT TGCACGAAAA
25141 CCGCCTTGGG CAAAACGTGC TTCAATTCCAC GCTCAAGGGC GAGGCGCGCC GCGACTACGT
25201 CCGCGACTGC GTTTACTTAT TTCTATGCTA CACCTGGCAG ACGGCCATGG GCGTTTGGCA
25261 GCAGTGCTTG GAGGAGTGCA ACCTCAAGGA GCTGCAGAAA CTGCTAAAGC AAAACTTGAA
25321 GGACCTATGG ACGGCCTTCA ACGAGCGCTC CGTGCCCGCG CACCTGGCGG ACATCATTTT
25381 CCCCGAACGC CTGCTTAAAA CCCTGCAACA GGGTCTGCCA GACTTCACCA GTCAAAGCAT
25441 GTTGCAAGAC TTTAGGAACT TTATCCTAGA GCGCTCAGGA ATCTTGCCCG CCACCTGCTG
25501 TGCACTTCCT AGCGACTTTG TGCCCATTA GTACCGCGAA TGCCCTCGCG CGCTTTGGGG
25561 CCACTGCTAC CTTCTGCAGC TAGCCAATA CTTTGCTTAC CACTCTGACA TAATGGAAGA
25621 CGTGAGCGGT GACGGTCTAC TGGAGTGCTA CTGTCGCTGC AACCTATGCA CCCCACCCG
25681 CTCCCTGGTT TGCAATTCGC AGCTGCTTAA CGAAAGTCAA ATTATCGGTA CCTTTGAGCT
25741 GCAGGGTCCC TCGCCTGACG AAAAGTCCGC GGCTCCGGGG TTGAAACTCA CTCGGGGGCT
25801 GTGGACGTCG GCTTACCTTC GCAAATTTGT ACCTGAGGAC TACCACGCCC ACGAGATTAG
25861 GTTCTACGAA GACCAATCCC GCCCGCCAAA TGCGGAGCTT ACCGCTGCG TCATTACCCA
25921 GGGCCACATT CTTGGCCAAT TGCAAGCCAT CAACAAAGCC CGCCAAGAGT TCTGCTACG
25981 AAAGGGACGG GGGGTTTACT TGGACCCCA GTCCGGCGAG GAGCTCAACC CAATCCCCC
26041 GCCGCCGAG CCCTATCAGC AGCAGCCGCG GGCCCTTGCT TCCCAGGATG GCACCCAAAA
26101 AGAAGCTGCA GCTGCCGCCG CCACCCACGG ACGAGGAGGA ATACTGGGAC AGTCAGGCAG
26161 AGGAGGTTTT GGACGAGGAG GAGGAGGACA TGATGGAAGA CTGGGAGAGC CTAGACGAGG
26221 AAGCTTCCGA GGTGGAAGAG GTGTCAGACG AAACACCGTC ACCCTCGGTC GCATTTCCCT
26281 CGCCGGCGCC CCAGAAATCG GCAACCGGTT CCAGCATGGC TACAACCTCC GCTCCTCAGG
26341 CGCCGCCGGC ACTGCCCGTT CGCCGACCCA ACCGTAGATG GGACACCACT GGAACAGGG

```



```

26401 CCGGTAAGTC CAAGCAGCCG CCGCCGTTAG CCCAAGAGCA ACAACAGCGC CAAGGCTACC
26461 GCTCATGGCG CGGGCACAAG AACGCCATAG TTGCTTGCTT GCAAGACTGT GGGGGCAACA
26521 TCTCCTTCGC CCGCCGCTTT CTTCTCTACC ATCACGGCGT GGCCTTCCCC CGTAAACATCC
26581 TGCATTACTA CCGTCATCTC TACAGCCCAT ACTGCACCGG CGGCAGCGGC AGCGGCAGCA
26641 ACAGCAGCGG CCACACAGAA GCAAAGGCGA CCGGATAGCA AGACTCTGAC AAAGCCCAAG
26701 AAATCCACAG CGGCGGCAGC AGCAGGAGGA GGAGCGCTGC GTCTGGCGCC CAACGAACCC
26761 GTATCGACCC GCGAGCTTAG AAACAGGATT TTTCCCACTC TGTATGCTAT ATTTCAACAG
26821 AGCAGGGGCC AAGAACAAGA GCTGAAAATA AAAACAGGT CTCTGCGATC CCTCACCCGC
26881 AGCTGACCTGT ATCACAAAAG CGAAGATCAG CTTGCGCGCA CGCTGGAAGA CGCGGAGGCT
26941 CTCTTCAGTA AATACTGCGC GCTGACTCTT AAGGACTAGT TTCGCGCCCT TTCTCAAATT
27001 TAAGCGCGAA AACTACGTCA TCTCCAGCGG CCACACCCGG CGCCAGCACC TGTCGTCAGC
27061 GCCATTATGA GCAAGGAAAT TCCCACGCCC TACATGTGGA GTTACCAGCC ACAAAATGGGA
27121 CTTGCGGCTG GAGCTGCCCA AGACTACTCA ACCCGAATAA ACTACATGAG CGCGGGACCC
27181 CACATGATAT CCCGGGTCAA CGGAATCCGC GCCCACCGAA ACCGAATTCT CTTGGAACAG
27241 GCGGCTATTA CCACCACACC TCGTAATAAC CTTAATCCCC GTAGTTGGCC CGTGCCCTG
27301 GTGTACCAGG AAAGTCCCGC TCCCACCACT GTGGTACTTC CCAGAGACGC CCAGGCGGAA
27361 GTTCAGATGA CTAACTCAGG GCGCGAGCTT GCGGGCGGCT TTCGTCACAG GGTGCGGTG
27421 CCCGGGCAGG GTATAACTCA CCTGACAATC AGAGGGCGAG GTATTGAGCT CAACGACGAG
27481 TCGGTGAGCT CCTCGCTTGG TCTCCGTCCG GACGGGACAT TTCAGATCGG CGGCGCCGGC
27541 CGTCCTTCAT TCACGCCTCG TCAGGCAATC CTAACCTGTC AGACCTCGTC CTCTGAGCCG
27601 CGCTCTGGAG GCATTGGAAC TCTGCAATTT ATTGAGGAGT TTGTGCCATC GGTCTACTTT
27661 AACCCCTTCT CGGGACCTCC CGGCCACTAT CCGGATCAAT TTATTCTTAA CTTTGACCGC
27721 GTAAAGGACT CGGCGGACGG CTACGACTGA ATGTAAAGTG GAGAGGCAGA GCAACTGCGC
27781 CTGAAACACC TGGTCCACTG TCGCCGCCAC AAGTGCTTTG CCCGCGACTC CGGTGAGTTT
27841 TGCTACTTTG AATTGCCCGA GGATCATATC GAGGGCCCGG CGCACGGCGT CCGGCTTACC
27901 GCCCAGGGAG AGCTTGCCCG TAGCCTGATT CCGGAGTTTA CCCAGCGCCC CCTGCTAGTT
27961 GAGCGGGACA GGGGACCCTG TGTCTCACT GTGATTTGCA ACTGTCCTAA CTTTGGATTA
28021 CATCAAGATC TTTGTTGCCA TCTCTGTGCT GAGTATAATA AATACAGAAA TTAAATATA
28081 CTGGGGCTCC TATCGCCATC CTGTAAACGC CACCGTCTTC ACCCGCCAA GCAAACCAAG
28141 GCGAACCTTA CCTGGTACTT TTAACATCTC TCCCTCTGTG ATTTACAACA GTTTCAACCC
28201 AGACGGAGTG AGTCTACGAG AGAACCTCTC CGAGCTCAGC TACTCCATCA GAAAAACAC
28261 CACCCTCCTT ACCTGCCGGG AACGTACGAG TGCGTCACCG GCCGCTGCAC CACACCTACC
28321 GCCTGACCGT AAACCAGACT TTTTCCGGAC AGACCTCAAT AACTCTGTTT ACCAGAACAG
28381 GAGGTGAGCT TAGAAAACCC TTAGGTATT AGGCCAAAGG CGCAGCTACT GTGGGGTTTA
28441 TGAACAATTG AAGCAACTCT ACGGGCTATT CTAATTCAGG TTTCTCTAGA AGTCAGGCTT
28501 CCTGGATGTC AGCATCTGAC TTTGGCCAGC ACCTGTCCCG CGGATTTGTT CCAGTCCAAC
28561 TACAGCGACC CACCCTAACA GAGATGACCA ACACAACCAA CGCGGCCGCC GCTACCGGAC
28621 TTACATCTAC CACAAATACA CCCCAGTTT CTGCCTTTGT CAATAACTGG GATAACTTGG
28681 GCATGTGGTG GTTCTCCATA GCGCTTATGT TTGTATGCCT TATTATTATG TGGCTCATCT
28741 GCTGCCTAAA GCGCAAACGC GCCCGACCAC CCATCTATAG TCCCATCATT GTGCTACACC
28801 CAAACAATGA TGGAATCCAT AGATTGACG GACTGAAACA CATGTTCTTT TCTCTTACAG
28861 TATGATTAAA TGAGATCTAG AAATGGACGG AATTATTACA GAGCAGCGCC TGCTAGAAAG
28921 ACGCAGGGCA GCGGCCGAGC AACAGCGCAT GAATCAAGAG CTCCAAGACA TGGTTAACTT
28981 GCACCAAGTG AAAAGGGGTA TCTTTTGTCT GGTAAAGCAG GCCAAAGTCA CCTACGACAG
29041 TAATACCACC GGACACCGCC TTAGCTACAA GTTGCCAACC AAGCGTCAGA AATTGGTGGT
29101 CATGGTGGGA GAAAAGCCCA TTACCATAAC TCAGCACTCG GTAGAAACCG AAGGCTGCAT
29161 TCACTCACCT TGTCAAGGAC CTGAGGATCT CTGCACCCCT ATTAAGACCC TGTGCGGTCT
29221 CAAAGATCTT ATTCCCTTTA ACTAATAAAA AAAAATAATA AAGCATCACT TACTTAAAT
29281 CAGTTAGCAA ATTTCTGTCC AGTTTATTCA GCAGCACCTC CTTGCCCTCC TCCCAGCTCT
29341 GGTATTGCAG CTTCTCTCTG GCTGCAAACT TTCTCCACAA TCTAAATGGA ATGTAGTTT
29401 CCTCCTGTTT CTGTCCATCC GCACCCACTA TCTTCATGTT GTTGCGAGATG AAGCGCGCAA
29461 GACCGTCTGA AGATACCTTC AACCCCGTGT ATCCATATGA CACGGAAACC GGTCTCCAA
29521 CTGTGCCTTT TCTTACTCCT CCGTTTGTAT CCCCAGTGG GTTTCAAGAG AGTCCCCTG
29581 GGGTACTCTC TTTGCGCCTA TCCGAACCTC TAGTTACCTC CAATGGCATG CTTGCGCTCA
29641 AAATGGGCAA CGGCCTCTCT CTGGACGAGG CCGGCAACCT TACCTCCCAA AATGTAACCA
29701 CTGTGAGCCC ACCTCTCAAA AAAACCAAGT CAAACATAAA CCTGGAAATA TCTGCACCCC
29761 TCACAGTTAC CTCAGAAGCC CTAAGTGTGG CTGCCGCGC ACCTCTAATG GTCGCGGGCA

```

```

29821 ACACACTCAC CATGCAATCA CAGGCCCCGC TAACCGTGCA CGACTCCAAA CTTAGCATTG
29881 CCACCCAAGG ACCCCTCACA GTGTCAGAAG GAAAGCTAGC CCTGCAAACA TCAGGCCCCC
29941 TCACCACCAC CGATAGCAGT ACCCTTACTA TCACTGCCTC ACCCCCTCTA ACTACTGCCA
30001 CTGGTAGCTT GGGCATTGAC TTGAAAGAGC CCATTTATAC ACAAAATGGA AAAGTAGGAC
30061 TAAAGTACGG GGCTCCTTTG CATGTAACAG ACGACCTAAA CACTTTGACC GTAGCAACTG
30121 GTCCAGGTGT GACTATTAAT AATACTTCCT TGCAAATAA AGTTACTGGA GCCTTGGGTT
30181 TTGATTCAACA AGGCAATATG CAACTTAATG TAGCAGGAGG ACTAAGGATT GATTCTCAAA
30241 ACAGACGCCT TATACTTGAT GTTAGTTATC CGTTTGATGC TCAAAACCAA CTAAATCTAA
30301 GACTAGGACA GGGCCCTCTT TTTATAAACT CAGCCCACAA CTTGGATATT AACTACAACA
30361 AAGGCCTTTA CTTGTTTACA GCTTCAAACA ATTCCAAAAA GCTTGAGGTT AACCTAAGCA
30421 CTGCCAAGGG GTTGATGTTT GACGCTACAG CCATAGCCAT TAATGCAGGA GATGGGCTTG
30481 AATTTGGTTC ACCTAATGCA CCAAACACAA ATCCCCTCAA AACAAAAATT GGCCATGGCC
30541 TAGAATTTGA TTCAAACAAG GCTATGGTTC CTAAACTAGG AACTGGCCTT AGTTTTGACA
30601 GCACAGGTGC CATTACAGTA GGAAACAAAA ATAATGATAA GCTAACTTTG TGGACCACAC
30661 CAGCTCCATC TCCTAACTGT AGACTAAATC CAGAGAAAGA TGCTAAACTC ACTTTGGTCT
30721 TAACAAAAATG TGGCAGTCAA ATACTTGCTA CAGTTTCAGT TTTGGCTGTT AAAGGCAGTT
30781 TGGCTCCAAT ATCTGGAACA GTTCAAAGTG CTCATCTTAT TATAAGATTT GACGAAAATG
30841 GAGTGCTACT AAACAATTCC TTCCTGGACC CAGAATATG GAACTTTAGA AATGGAGATC
30901 TTAAGTGAAG CACAGCCTAT ACAAACGCTG TTGGATTTAT GCCTAACCTA TCAGCTTATC
30961 CAAAATCTCA CGGTAAAACCT GCCAAAAGTA ACATTGTCAG TCAAGTTTAC TTAAACGGAG
31021 ACAAACCTAA ACCTGTAACA CTAACCATT AACTAAACGG TACACAGGAA ACAGGAGACA
31081 CAACTCCAAG TGCATACTCT ATGTCAATTT CATGGGACTG GTCTGGCCAC AACTACATTA
31141 ATGAAATATT TGCCACATCC TCTTACACTT TTTCATACAT TGCCCAAGAA TAAAGAATCG
31201 TTTGTGTTAT GTTTCAACGT GTTTATTTTT CAATTGCAGA AAATTTCAAG TCATTTTTCA
31261 TTCAGTAGTA TAGCCCCACC ACCACATAGC TTATACAGAT CACCGTACCT TAATCAAACCT
31321 CACAGAACCC TAGTATTCAA CCTGCCACCT CCCTCCCAAC ACACAGAGTA CACAGTCCTT
31381 TCTCCCGGCG TGGCCTTAAA AAGCATCATA TCATGGGTAA CAGACATATT CTTAGGTGTT
31441 ATATTCCACA CGGTTTCCTG TCGAGCCAAA CGCTCATCAG TGATATTAAT AAACCTCCCG
31501 GGCAGCTCAC TTAAGTTCAT GTCGCTGTCC AGCTGCTGAG CCACAGGCTG CTGTCCAACCT
31561 TGCGGTTGCT TAACGGGCGG CGAAGGAGAA GTCCACGCCT ACATGGGGGT AGAGTCATAA
31621 TCGTGCATCA GGATAGGGCG GTGGTGCTGC AGCAGCGCGC GAATAAACTG CTGCCGCCGC
31681 CGCTCCGTCC TGCAGGAATA CAACATGGCA GTGGTCTCCT CAGCGATGAT TCGCACCGCC
31741 CGCAGCATAA GCGCCTTGT CCTCCGGGCA CAGCAGCGCA CCCTGATCTC ACTTAAATCA
31801 GCACAGTAAC TGCAGCACAG CACCACAATA TTGTTCAAAA TCCCACAGTG CAAGGCGCTG
31861 TATCCAAAGC TCATGGCGGG GACCACAGAA CCCACGTGGC CATCATACCA CAAGCGCAGG
31921 TAGATTAAGT GCGGACCCCT CATAAACACG CTGGACATAA ACATTACCTC TTTTGGCATG
31981 TTGTAATTCA CCACCTCCCG GTACCATATA AACCTCTGAT TAAACATGGC GCCATCCACC
32041 ACCATCCTAA ACCAGCTGGC CAAAACCTGC CCGCCGGCTA TACACTGCAG GGAACCGGGA
32101 CTGGAACAAT GACAGTGGAG AGCCCAGGAC TCGTAACCAT GGATCATCAT GCTCGTCATG
32161 ATATCAATGT TGGCACAACA CAGGCACACG TGCATACACT TCCTCAGGAT TACAAGCTCC
32221 TCCCGCGTTA GAACCATATC CCAGGGAACA ACCCATTCCT GAATCAGCGT AAATCCACA
32281 CTGCAGGGAA GACCTCGCAC GTAACCTACG TTGTGCATTG TCAAAGTGTT ACATTGCGGC
32341 AGCAGCGGAT GATCCTCCAG TATGGTAGCG CGGGTTTCTG TCTCAAAAGG AGGTAGACGA
32401 TCCCTACTGT ACGGAGTGGC CCGAGACAAC CGAGATCGTG TTGGTCGTAG TGTCATGCCA
32461 AATGGAACGC CGGACGTAGT CATATTTCTT GAAGCAAAAC CAGGTGCGGG CGTGACAAAC
32521 AGATCTGCGT CTCGGGTCTC GCCGCTTAGA TCGCTCTGTG TAGTAGTTGT AGTATATCCA
32581 CTCTCTCAA GCATCCAGGC GCCCCCTGGC TTCGGGTTCT ATGTAAACTC CTTTCATGCGC
32641 CGCTGCCCTG ATAACATCCA CCACCGCAGA ATAAGCCACA CCCAGCCAAC CTACACATTC
32701 GTTCTGCGAG TCACACACGG GAGGAGCGGG AAGAGCTGGA AGAACCATGT TTTTTTTTTT
32761 ATTCCAAAAG ATTATCCAAA ACCTCAAAAT GAAGATCTAT TAAGTGAACG CGCTCCCCTC
32821 CGGTGGCGTG GTCAAACCTC ACAGCCAAAG AACAGATAAT GGCATTTGTA AGATGTTGCA
32881 CAATGGCTTC CAAAAGGCAA ACGGCCCTCA CGTCCAAGTG GACGTAAAGG CTAAACCTT
32941 CAGGGTGAAT CTCTCTATA AACATTCCAG CACCTTCAAC CATGCCCAA TAATTCTCAT
33001 CTCGCCACCT TCTCAATATA TCTCTAAGCA AATCCCGAAT ATTAAGTCCG GCCATTGTAA
33061 AAATCTGCTC CAGAGCGCCC TCCACCTTCA GCCTCAAGCA GCGAATCATG ATTGCAAAAA
33121 TTCAGGTTCC TCACAGACCT GTATAAGATT CAAAAGCGGA ACATTAAACA AAATACCGCG
33181 ATCCCGTAGG TCCCTTCGCA GGGCCAGCTG AACATAATCG TGCAGGTCTG CACGGACCAG

```

33241 CGCGGCCACT TCCCCGCCAG GAACCTTGAC AAAAGAACCC ACACTGATTA TGACACGCAT
33301 ACTCGGAGCT ATGCTAACCA GCGTAGCCCC GATGTAAGCT TTGTTGCATG GCGGGCGATA
33361 TAAATGCAA GGTGCTGCTC AAAAAATCAG GCAAAGCCTC GCGCAAAAAA GAAAGCACAT
33421 CGTAGTCATG CTCATGCAGA TAAAGGCAGG TAAGCTCCGG AACCACCACA GAAAAAGACA
33481 CCATTTTTCT CTCAAACATG TCTGCGGGTT TCTGCATAAA CACAAAATAA AATAACAAAA
33541 AAACATTTAA ACATTAGAAG CCTGTCTTAC AACAGGAAAA ACAACCCTTA TAAGCATAAG
33601 ACGGACTACG GCCATGCCGG CGTGACCGTA AAAAACTGG TCACCGTGAT TAAAAAGCAC
33661 CACCGACAGC TCCTCGGTCA TGTCCGGAGT CATAATGTAA GACTCGGTAA ACACATCAGG
33721 TTGATTATC GGTCACTGCT AAAAAGCGAC CGAAATAGCC CGGGGAATA CATACCCGCA
33781 GCGGTAGAGA CAACATTACA GCCCCATAG GAGGTATAAC AAAATTAATA GGAGAGAAAA
33841 ACACATAAAC ACCTGAAAA CCCTCCTGCC TAGGCAAAAT AGCACCTCC CGCTCCAGAA
33901 CAACATACAG CGCTTCACAG CGGCAGCCTA ACAGTCAGCC TTACCAGTAA AAAAGAAAAC
33961 CTATTAAAAA AACACCACTC GACACGGCAC CAGCTCAATC AGTCACAGTG TAAAAAGGG
34021 CCAAGTGCAG AGCGAGTATA TATAGGACTA AAAATGACG TAACGGTTAA AGTCCACAAA
34081 AAACACCCAG AAAACCGCAC GCGAACCTAC GCCCAGAAAC GAAAGCCAAA AAACCCACAA
34141 CTTCTCTCAA TCGTCACTTC CGTTTTCCCA CGTTACGTAA CTTCCCATTT TAAGAAAACCT
34201 ACAATTCCCA ACACATACAA GTTACTCCGC CCTAAAACCT ACGTCACCCG CCCCCTTCCC
34261 ACGCCCCGCG CCACGTCACA AACTCCACCC CCTCATTATC ATATTGGCTT CAATCCAAAA
34321 TAAGGTATAT TATTGATGAT G

//

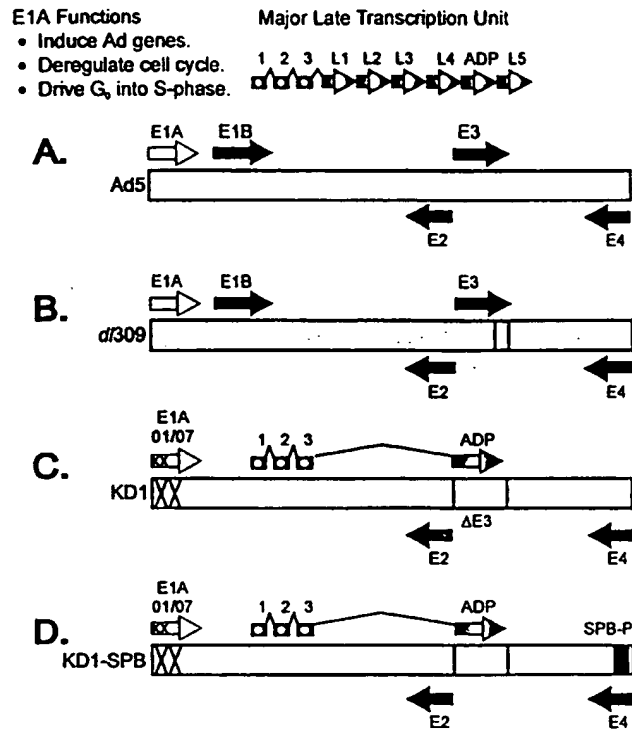


FIGURE 24

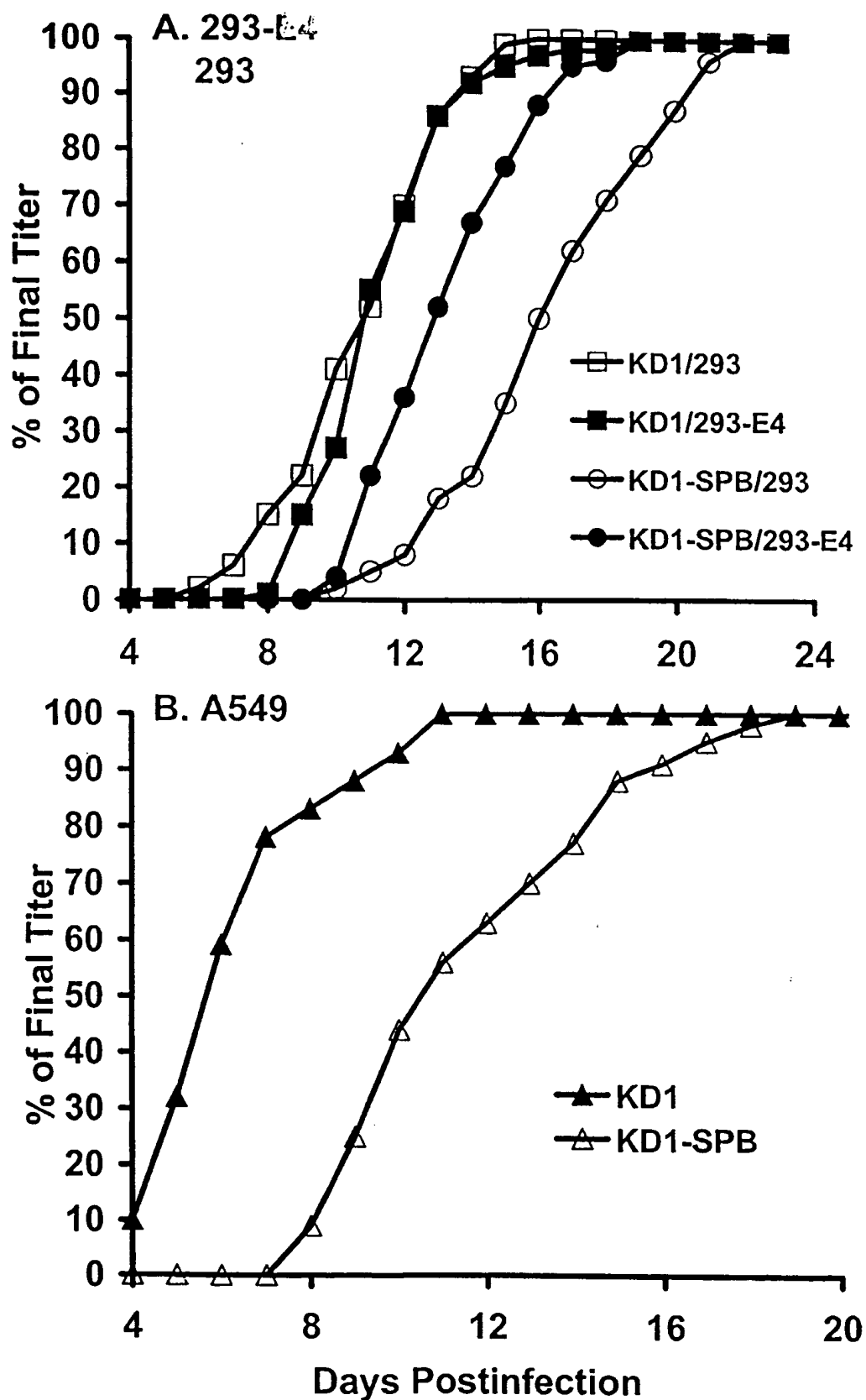


FIGURE 25

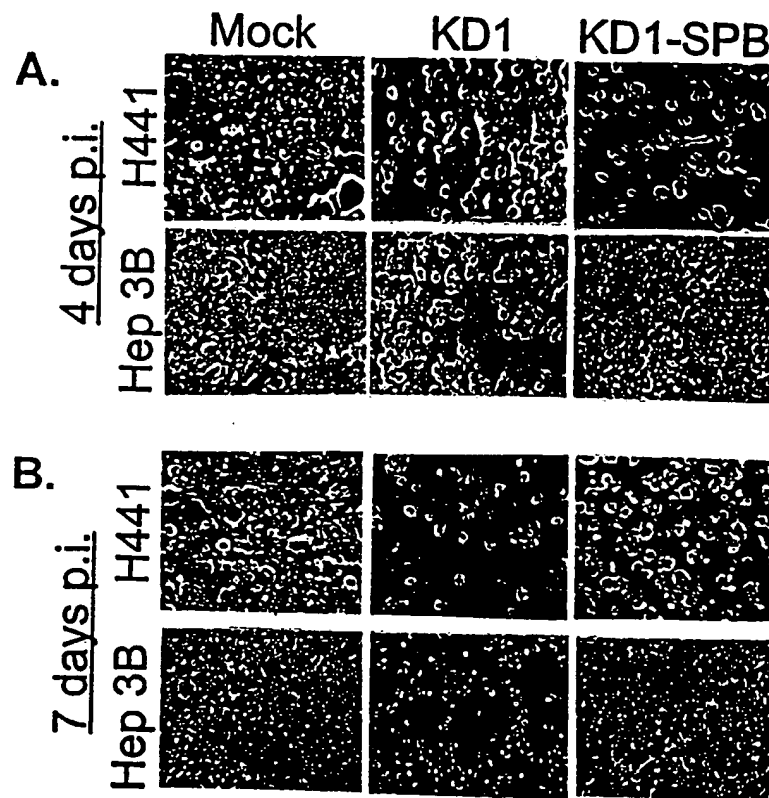


FIGURE 26

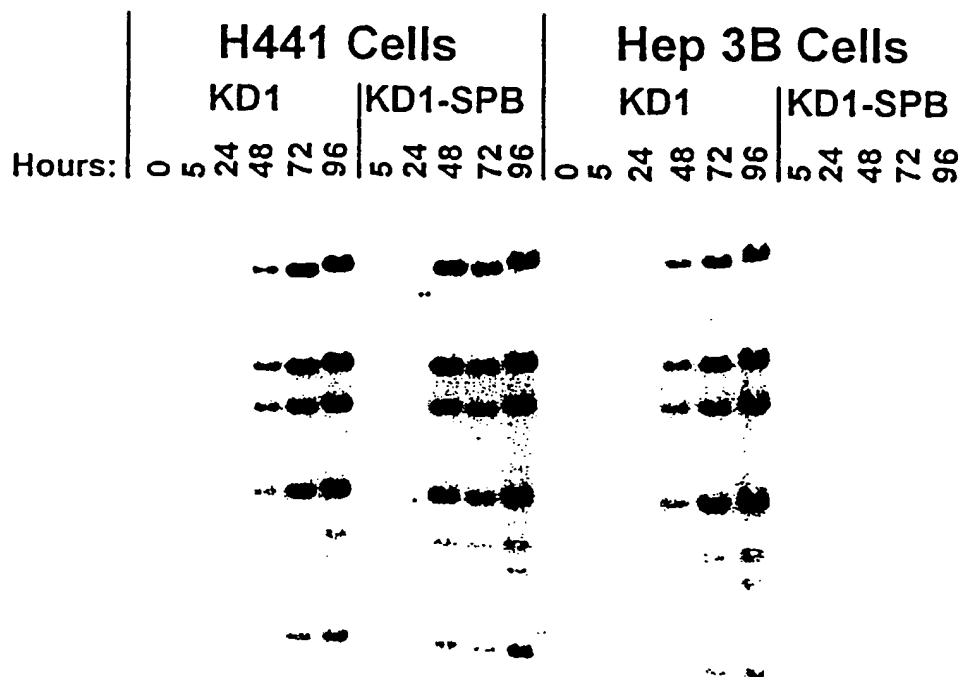


FIGURE 27A

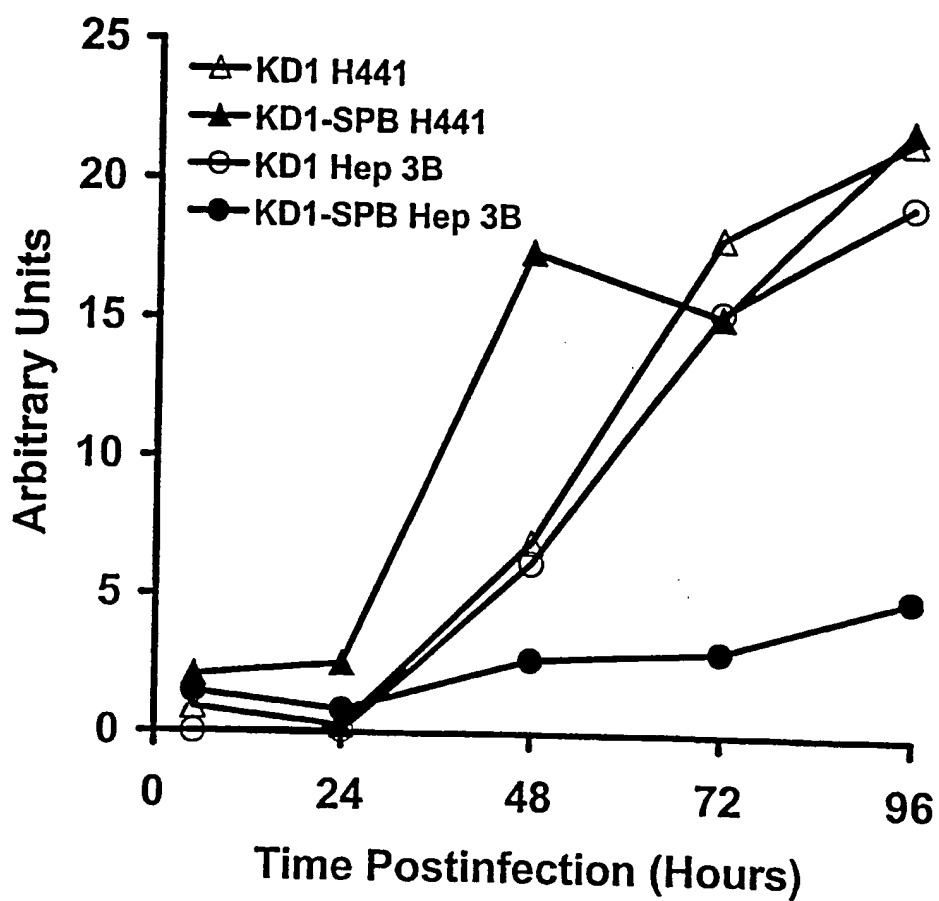
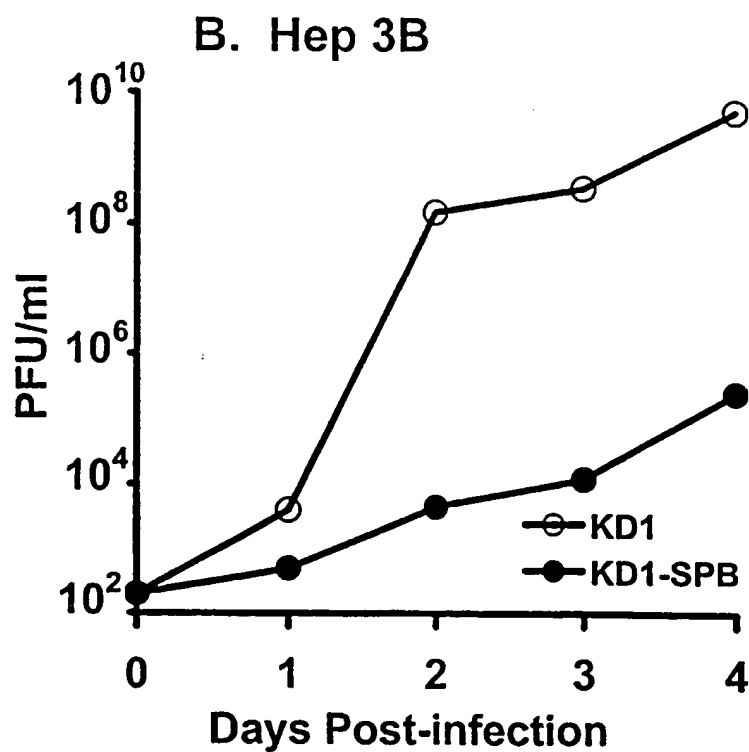
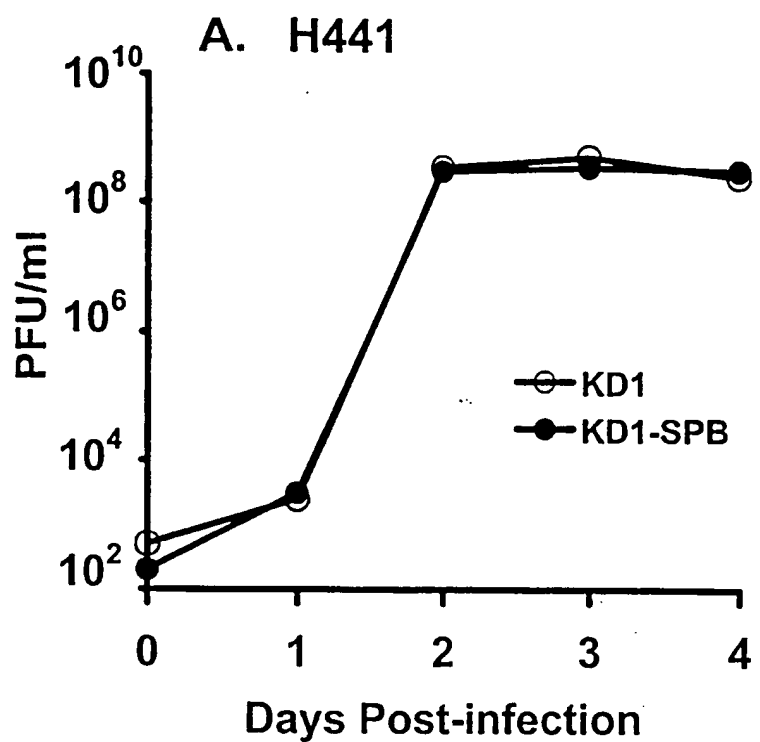
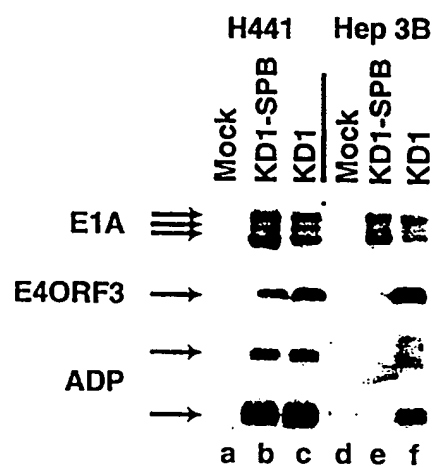


FIGURE 27B

**FIGURE 28**

**FIGURE 29**

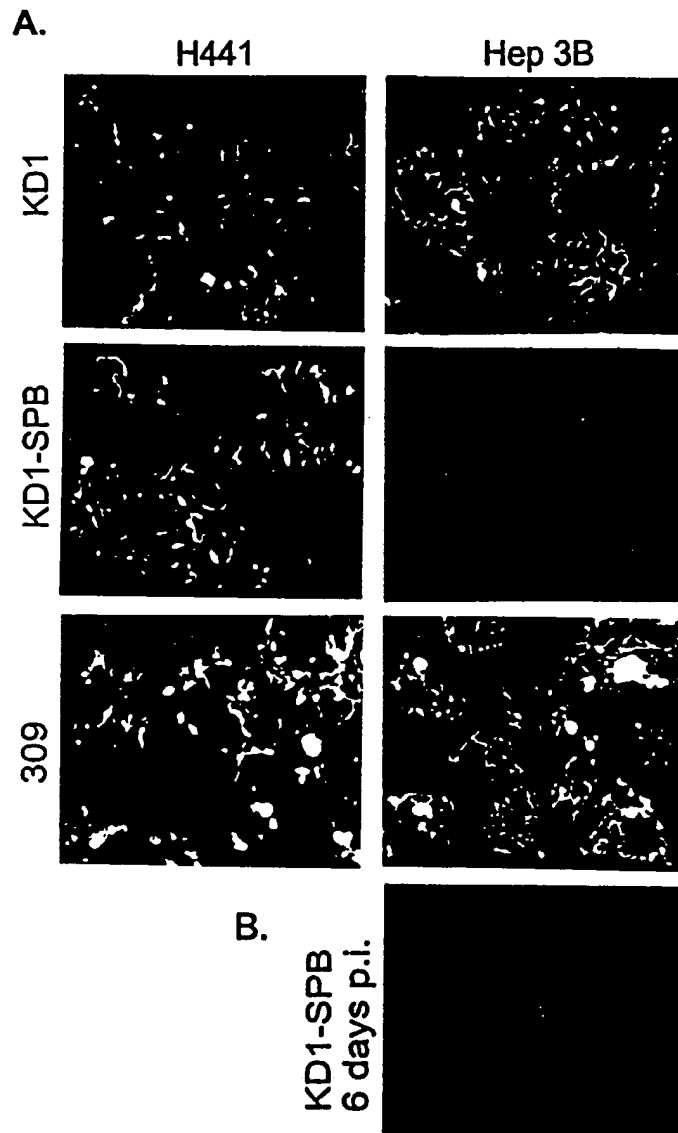
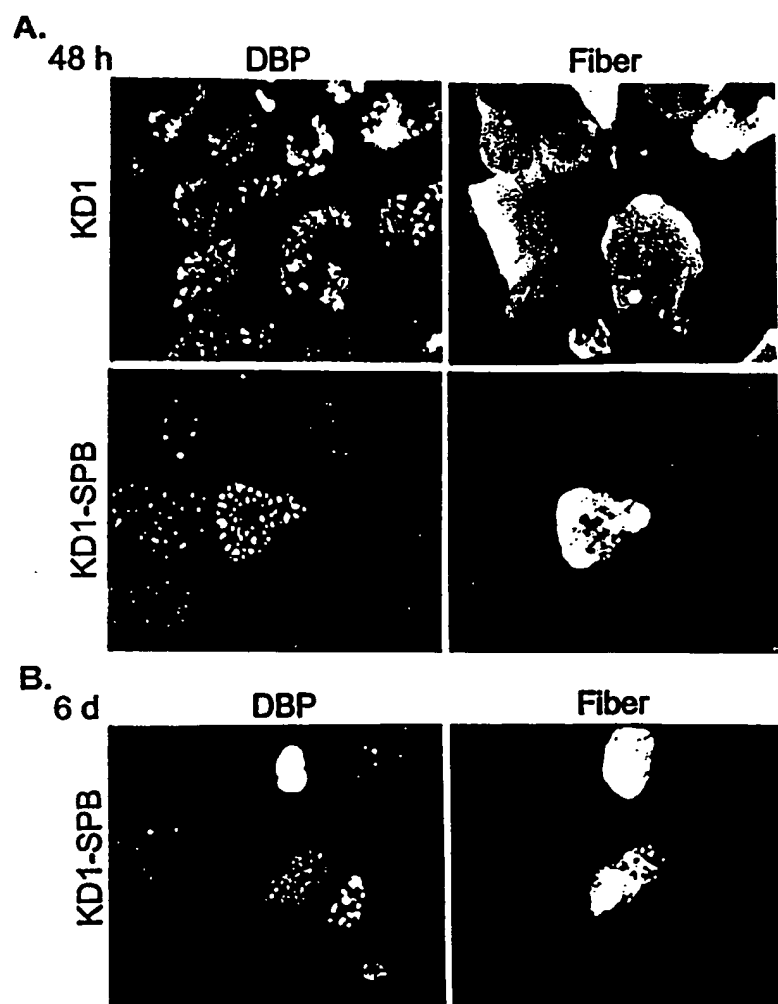


FIGURE 30

**FIGURE 31**

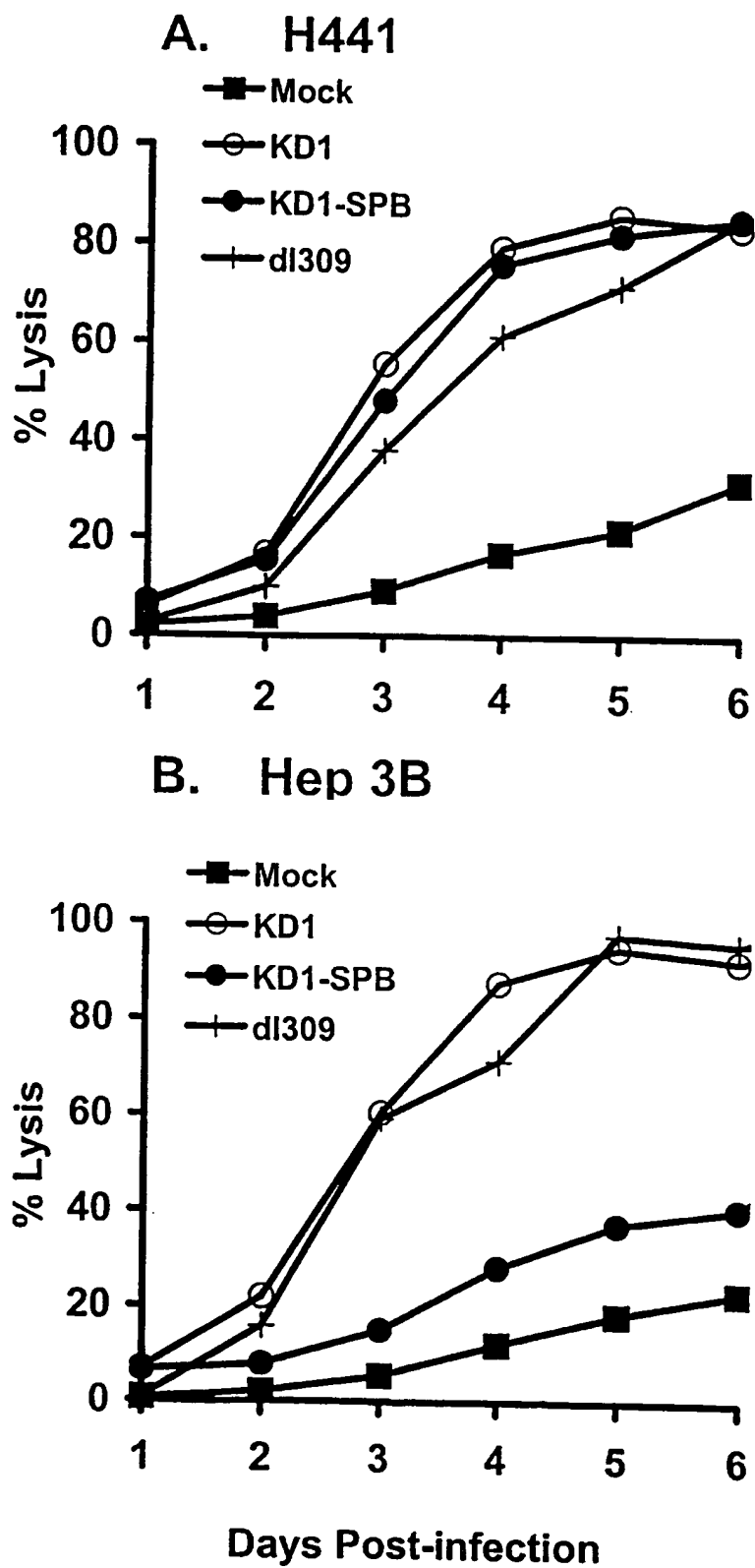


FIGURE 32

65/66

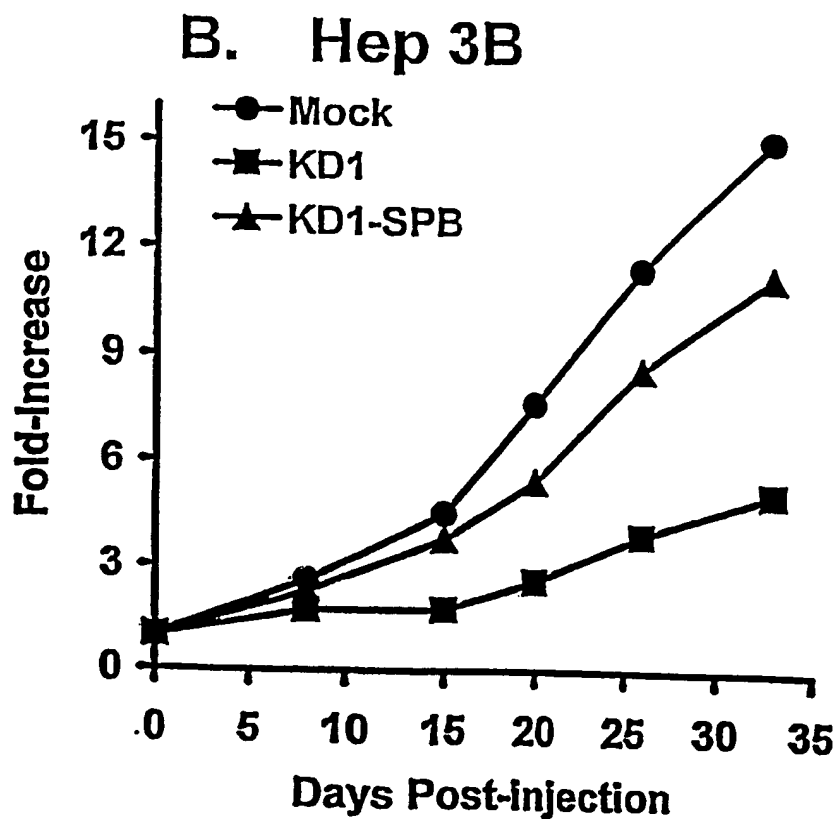
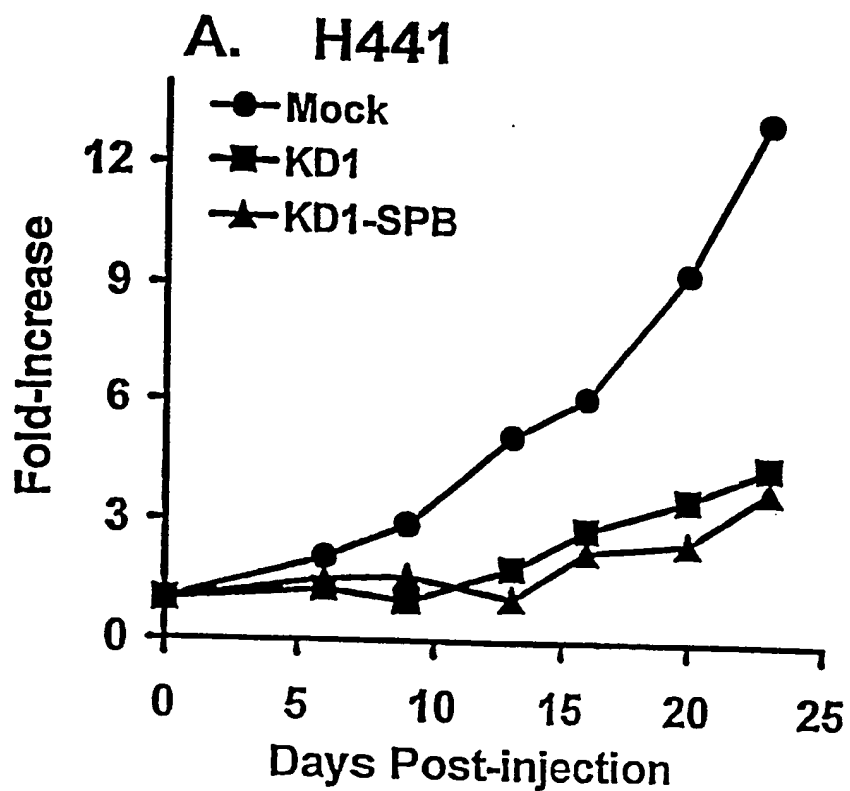


FIGURE 33

66/66

SEQUENCE LISTING

<110> Wold, William S.M.
Toth, Karoly
Doronin, Konstantin
Tollefson, Ann E.

<120> Replication-Competent Anti-Cancer Vectors

<130> 16153-5152

<140>

<141>

<150> 09/351,778

<151> 1999-07-12

<160> 20

<170> PatentIn Ver. 2.0

<210> 1

<211> 33592

<212> DNA

<213> Adenovirus subgroup C

<400> 1

```
catcatcaat aatatacctt attttggatt gaagccaata tgataatgag ggggtggagt 60
ttgtgacgtg gcgcggggcg tgggaacggg gcgggtgacg tagtagtgtg gcggaagtgt 120
gatgttgcaa gtgtggcgga acacatgtaa gcgacggatg tggcaaaaagt gacgtttttg 180
gtgtgcgccg gtgtacacag gaagtgaaca ttttcgcgcg gttttaggcg gatgttgtag 240
taaatattggg cgtaaccgag taagatttgg ccattttcgc gggaaaactg aataagagga 300
agtgaatct gaataatttt gtgttactca tagcgcgtaa tatttgtcta gggccgcggg 360
gactttgacc gtttacgtgg agactcgccc aggtgttttt cttaggtgtt ttccgcgttc 420
cgggtcaaa gtggcgtttt attattatag tcagctgacg ttagtgttat ttatacccg 480
tgagttcctc aagaggccac tcttgagtgc cagcgagtag agttttctcc tccgagccgc 540
tccgacaccg ggactgaaaa tgagacatga ggtactggct gataatcttc cacctcctag 600
ccattttgaa ccacctaccc ttacacgaact gtatgattta gacgtgacgg cccccaaga 660
tcccaacgag gaggcggttt cgcagatttt tcccgactct gtaatgttg cggtgcagga 720
agggttgac ttactcactt ttccgcggcg gcccggttct ccggagccgc ctacaccttc 780
ccggcagccc gagcagccgg agcagagagc ctgggtccg gtttgccag aggtggctt 840
tccaccaggt gacgacgagg atgaagaggg tgaggagtgt gtgttagatt atgtggagca 900
ccccgggac ggttgacagt cttgtcatta tcaccggagg aatacggggg acccagatat 960
tatgtgttcg ctttgctata tgaggacctg tggcatgttt gtctacagta agtgaaaatt 1020
atgggcagtg ggtgatagag tgggtgggtt ggtgtggtta tttttttttt aatttttaca 1080
gtttttgtgt ttaaagaatt ttgtattgtg atttttttaa aaggtcctgt gtctgaacct 1140
gagcctgagc ccgagccaga accggagcct gcaagaccta cccgccgtcc taaaatggcg 1200
cctgctatcc tgagacgccc gacatcacct gtgtctagag aatgcaatag tagtacggat 1260
agctgtgact ccggtccttc taacacacct cctgagatac acccggtggg cccgctgtgc 1320
cccattaaac cagttgccgt gagagttggg gggcgtcgcc aggtgtgga atgtatcgag 1380
gacttgctta acgagcctgg gcaacctttg gacttgagct gtaaacgccc caggccataa 1440
gggtgtaaacc tgtgattgag tgtgtggtta acgcctttgt ttgctgaatg agttgatgta 1500
agtttaataa aggggtgagat aatgtttaac ttgcatggcg tgttaaattg ggcggggcct 1560
aaagggtata taatgcgccg tgggctaact ttggttacat ctgacctcat ggaggcttgg 1620
gagtgtttgg aagatttttc tgctgtgcgt aacttgctgg aacagagctc taacagtagc 1680
tcttggtttt ggaggtttct gtggggctca tcccaggcaa agttagtctg cagaattaag 1740
gaggattaca agtgggaatt tgaagagctt ttgaaatcct gtggtgagct gtttgattct 1800
ttgaatctgg gtcaccaggc gcttttccaa gagaaggtca tcaagacttt ggatttttcc 1860
acaccggggc gcgtgcggcg tctgttgcgt tttttgagtt ttataaagga taaatggagc 1920
gaagaacccc atctgagcgg ggggtacgtg ctggattttc tggccatgca tctgtggaga 1980
gcggttgtag gacacaagaa tcgcctgcta ctgttgtctt ccgtccgccc ggcgataata 2040
ccgacggagg agcagcagca gcagcaggag gaagccaggc gccggcgcca ggagcagagc 2100
ccatggaacc cgagagccgg cctggaccct cggaatgaa tgtgtacag gtggctgaac 2160
tgtatccaga actgagacgc attttgacaa ttacagagga tgggcagggg ctaaaagggg 2220
taaagaggga gcggggggct tgtgaggcta cagaggaggc taggaatcta gcttttagct 2280
taatgaccag acaccgtcct gagtgtatta cttttcaaca gatcaaggat aattgcgcta 2340
```

atgagcttga tctgctggcg cagaagtatt ccatagagca gctgaccact tactggctgc 2400
 agccaggggg tgaatttgag gagggctatta gggatatatgc aaagggtggca cttaggccag 2460
 attgcaagta caagatcagc aaacttgtaa atatcaggaa ttgttgctac atttctggga 2520
 acggggccga ggtggagata gatacggagg atagggtggc ctttagatgt agcatgataa 2580
 atatgtggcc gggggtgctt ggcatggacg ggggtggtat tatgaatgta aggtttactg 2640
 gcccgaattt tagcggtagc gttttcctgg ccaataccaa cttatccta cacggtgtaa 2700
 gcttctatgg gtttaacaat acctgtgtgg aagcctggac cgatgtaagg gttcggggct 2760
 gtgcctttta ctgctgctgg aaggggtggg tgtgtcgccc caaaagcagg gcttcaatta 2820
 agaaatgcct ctttgaaagg tgtacctgg gtatcctgtc tgagggtaac tccagggtgc 2880
 gccacaatgt ggctccgac tgtggttgc tcatgctagt gaaaagcgtg gctgtgatta 2940
 agcataacat ggtatgtggc aactgagagg acagggcctc tcagatgctg acctgctcgg 3000
 acggcaactg tcacctgctg aagaccattc acgtagccag ccactctcgc aaggcctggc 3060
 cagtgtttga gcataacata ctgaccgct gttccttgca tttgggtaac aggagggggg 3120
 tgttcttacc ttaccaatgc aatttgagtc acactaagat attgcttgag cccgagagca 3180
 tgtccaaggt gaacctgaac ggggtgtttg acatgaccat gaagatctgg aagggtctga 3240
 ggtacgatga gaccgcgacc aggtgcagac cctgcgagtg tggcggtaaa catattagga 3300
 accagcctgt gatgctggat gtgaccgagg agctgaggcc cgatcacttg gtgctggcct 3360
 gcaccgcgc tgagtttggc tctagcgatg aagatacaga ttgaggtact gaaatgtgtg 3420
 ggcgtggctt aagggtggga aagaatatat aagggtgggg tcttatgtag ttttgtatct 3480
 gttttgcagc agccgcgccc gccatgagca ccaactcgtt tgatggaagc attgtgagct 3540
 catatttgac aacgcgcatg ccccatggg ccgggtgctg tcagaatgtg atgggtcca 3600
 gcattgatgg tcgccccgtc ctgcccgaac actctactac cttgacctac gagaccgtgt 3660
 ctggaacgcc gttggagact gcagcctccg ccgccccttc agccgctgca gccaccgccc 3720
 gcgggattgt gactgacttt gctttctcga gcccgcttgc aagcagtga gcttcccggt 3780
 catccgcccg cgatgacaag ttgacggctc ttttggcaca attggattct ttgaccggg 3840
 aacttaattg cgtttctcag cagctgttgg atctgcgcca gcaggtttct gccctgaagg 3900
 cttctctccc tcccaatgcg gtttaaaaca taaataaaaa accagactct gtttggattt 3960
 ggatcaagca agtgtcttgc tgtctttatt taggggtttt gcgcgcgagg tagggccggg 4020
 accagcggtc tcggctcgtt agggctcctgt gtattttttc caggacgtgg taaaggtagc 4080
 tctggatggt cagatacatg ggcataagcc cgtctctggg gtggaggtag caccactgca 4140
 gagcttcata ctgcgggggt gtgtttaga tgatccagtc gtagcaggag cgctgggcgt 4200
 ggtgcctaaa aatgtcttcc agtagcaagc tgattgccag gggcaggccc ttgggtgaag 4260
 tgtttacaaa cgggttaagc tgggatgggt gcatacgtg ggatatgaga tgcactcttg 4320
 actgtatttt taggttggct atgttcccag ccggtgactc tgggaaattt gtcagttagc ttagaaggaa 4440
 gaaccaccag cacagtgtat ccggtgactc tgggaaattt gtcagttagc ttagaaggaa 4440
 atgcgtggaa gaacttggag acgcccctgt gacctccaag attttccatg cattcgtcca 4500
 taatgatggc aatgggccc cgggcggcgg cctgggcgaa gatatttctg ggatcactaa 4560
 cgtcatagtt gtgttccagg atgagatcgt cataggccat ttttacaag cgcgggcgga 4620
 ggggtgccga ctgcggtata atggttccat ccggcccagg ggcgtagtta cctcacaga 4680
 tttgcatttc ccacgctttg agttcagatg gggggatcat gtctacctgc ggggcgatga 4740
 agaaaacggt ttccggggta ggggagatca gctgggaaga aagcaggttc ctgagcagct 4800
 gcgacttacc gcagccggtg ggcccgtaaa tcacacctat tacgggtgac aactggtagt 4860
 taagagatgt gcagctgccg tcatccctga gcaggggggc cacttcgtta agcatgtccc 4920
 tgactcgcat gttttccctg accaaatccg ccagaaggcg ctgcgcgccc agcgatagca 4980
 gttcttgcaa ggaagcaaa tttttcaacg gtttgagacc gtccgcccgt ggcatgcttt 5040
 tgagcgtttg accaagcagt tccaggcggt cccacagctc ggtcacctgc tctacggcat 5100
 ctcgatccag catatctcct cgtttccggt gttggggcgg ctttcgctgt acggcagtag 5160
 tcgggtgctc tccagacggg ccagggtcat gtctttccac gggcgagggg tcctcgtcag 5220
 cgtagtcttg gtcacggtga aggggtgcgc tccgggctgc gcgctggcca ggtgctcgtt 5280
 gaggtcggtc ctgctggtgc tgaagcgctg ccggtcttcc cctgctcggt cggccaggtg 5340
 gcaattgacc atggtgtcat agtccagccc ctccgcggcg tggcccttgg cgcgacgtt 5400
 gcccttggag gaggcgccc acgaggggca gtgcagactt ttgagggcgt agagcttggg 5460
 cgcgagaaat accgattccg gggagtaggc atccgcgcgc caggccccgc agacggtctc 5520
 gcattccacg agccagggtg gctctggccg ttcggggtca aaaaccagggt tcccccatg 5580
 ctttttgatg cgtttcttac ctctggtttc catgagccgg tgtccacgct cggtgacgaa 5640
 aaggctgtcc gtgtccccgt atacagactt gagaggcctg tcctcgagcg gtgttcccgc 5700
 gtcctcctcg tatagaaact cggaccactc tgagacaaag gctcgctgcc aggccagcac 5760
 gaaggaggct aagtgggagg ggtagcggtc gttgtccact agggggtcca ctgcctccag 5820
 ggtgtgaaga cacatgtcgc cctcttcggc atcaaggaa gtaggtggtt ttaggtgta 5880
 ggccacgtga ccgggtgttc tgaaggggg gctataaaag ggggtggggg cggttctcgc 5940
 ctactctctc tccgcatcgc tgtctgcgag ggccagctgt tgggtgaggt actccctctg 6000
 aaaagcgggc atgacttctg cgctaagatt gtcagtttcc aaaaacgagg aggatttgat 6060
 attcacttgg cccgcggtga tgcctttgag ggtggccgca tccatctggt cagaaaaagac 6120
 aatctttttg ttgtcaagct tgggtgcaaa cgaccgtag agggcggttg acagcaactt 6180
 ggcgatggag cgcagggttt ggttttctgc gcgatcgccg cgtccttgg ccgcatggtt 6240
 tagctgcacg tatttcgcgc caacgcacccg ccattcggga aagacggttg tgcgctcgtc 6300

gggcaccagg tgcacgcgcc aaccgcggtt gtgcaggggtg acaaggtcaa cgctggtggc 6360
 tacctctccg cgtaggcgct cggttggtcca gcagagggcg ccgcccttgc gcgagcagaa 6420
 tggcggtagg gggctctagct gcgtctcgtc cgggggggtc gcgtccacgg taaagacccc 6480
 gggcagcagg cgcgcgtcga agtagtctat cttgcatcct tgcaagtcta gcgcctgctg 6540
 ccatgcgcgg gcggcaagcg cgcgctcgtat tgggttgagt gggggacccc atggcatggg 6600
 gtgggtgagc gcggagcgct acatgccgca aatgtcgtaa acgtagaggg gctctctgag 6660
 tattccaaga tatgtagggt agcatcttcc accgcggatg ctggcgcgca cgtaatcgta 6720
 tagttcgtgc gagggagcga ggaggtcggg accgaggttg ctacggcgcg gctgctctgc 6780
 tcggaagact atctgcctga agatggcatg tgagttggat gatattggtg gacgctggaa 6840
 gacgttgaag ctggcgtctg tgagacctac cgcgtcacgc acgaaggagg cgtaggagtc 6900
 gcgcagcttg ttgaccagct cggcgggtgac ctgcacgtct agggcgaggt agtccagggt 6960
 ttctctgatg atgtcatact tatcctgtcc cttttttttc cacagctcgc ggttgaggac 7020
 aaactcttcg cggtcttttc agtactcttg gatcggaac ccgtcggcct ccgaacggta 7080
 agagcctagc atgtagaact ggttgacggc ctggtagggc cagcatccct tttctacggg 7140
 tagcgcgtat gcctgcgcgg ccttccggag cgaggtgtgg gtgagcgcaa aggtgtccct 7200
 gacctgact ttgaggtact ggtatttgaa gtcagtgtcg tcgcatccgc cctgtcccca 7260
 gagcaaaaag tccgtgcgct ttttggaacg cggatttggc agggcggaagg tgacatcggt 7320
 gaagagtatc tttcccgcg caggcataaa gttgcgtgtg atgcgggaagg gtcccggcac 7380
 ctccgaacgg ttgttaatta cctgggcggc gagcacgatc tcgtcaaagc cgttgatgtt 7440
 gtggccacac atgtaaagtt ccaagaagcg cgggatgccc ttgatggaag gcaatttttt 7500
 aagttctctg taggtgagct cttcagggga gctgagcccg tgctctgaaa gggccagtc 7560
 tgcaagatga gggttggaag cgacgaatga gctccacagg tcacgggcca ttagcatttg 7620
 caggtggtcg cgaaaggctc taaactggcg acctatggcc atttttctg ggggtgatga 7680
 gtagaaggta agcgggtctt gttcccagcg gtccccatcca aggttcgcg ctaggctctg 7740
 cgcggcagtc actagaggct catctccgcc gaacttcgat accagcatga agggcacgag 7800
 ctgcttccca aaggccccc tccaagtata ggtctctaca tcgtagggtg caaagagacg 7860
 ctccgtgcga ggatgcgagc cgatcgggaa gaactggatc tcccgcacc aattggagga 7920
 gtggctattg atgtggtgaa agtagaagtc cctgcgacgg gccgaacact cgtgctgggt 7980
 tttgtaaaaa cgtgcgcagt actggcagcg gtgcacgggc tgtacatcct gcacgaggtt 8040
 gacctgacga ccgcgcacaa ggaagcagag tgggaatttg agccctcgc ctggcgggtt 8100
 tggctggtgg tcttctactt cggtgtcttg tccttgaccg tctggctgct cgaggggagt 8160
 tacggtggat cggaccacca cgcgcgagtg gcccgaagtc cagatgtccg cgcgcggcgg 8220
 tcggagcttg atgacaacat cgcgcagatg ggagctgtcc atggtctgga gctcccgcgg 8280
 cgctcaggtc ggcgggagct cctgcaggtt tacctcgcag agacgggtca gggcgcggcg 8340
 tagatccagg tgatacctaa tttccagggg ctggttggtg gcggcgtcga tggcttgcaa 8400
 gagggccgat ccccgcgggc cgactacggt accgcgcggc gggcggtggg ccgcgggggt 8460
 gtccttggtg gatgcatcta aaagcgggtg cgcgggcgag ccccgaggag tagggggggg 8520
 tccggacccg ccgggagagg gggcaggggc acgtcggcgc cgcgcgcggg caggagctgg 8580
 tgctgcgcgc gtaggttgct ggcgaacgcg acgacgcggc ggttgatctc ctgaatctgg 8640
 cgcctctgcg tgaagacgac gggcccggtg agcttgagcc tgaagagag ttcgacagaa 8700
 tcaatttcgg tgctgtgac ggcggcctgg cgcaaatct cctgcacgtc tcctgagttg 8760
 tcttgatagg cgatctcggc catgaactct cctcctggag atctccgcgt 8820
 ccggctcgtc ccacggtggc ggcgaggtcg ttggaaatgc gggccatgag ctgcgagaag 8880
 gcgttgaggc ctccctcgtt ccagacgcgg ctgtagacca cgccccctc ggcgaagac ggcgtagttt 9000
 gcgcgcatga ccacctgcgc gagattgagc tcacagtgcc gggcggaagac ggcgtagttt 9060
 cgcaggcgct gaaagaggta gttgaggggt gtggcggtgt gttctgccac gaagaagtac 9120
 ataaccagc gtcgcaacgt ggattcgttg atatcccca aggcctcaag gcgctccatg 9180
 gcctcgtaga agtccacggc gaagttgaaa aactgggagt tgcgcgccga cacggttaac 9240
 tcctctccca gaagacggat gagctcggcg acagtgtcgc gcacctcgcg ctcaaaggct 9300
 acagggccct cttcttcttc ttcaatctcc tcttcataa gggcctcccc tttcttctt 9360
 tctggcgggc gtgggggagg ggggacacgg cggcgacgac ggcgacccgg gaggcggtcg 9420
 acaaagcgct cgatcatctc cccgcggcga cggcgcatgg tctcggtgac ggcgggcgcg 9480
 ttctcgcggg ggcgcagttg gaagacgcgg cccgtcatgt cccggttatg ggttggcggg 9540
 gggctgccat gcggcagggg tacggcgcta acgatgcatc tcaacaattg ttgtgtaggt 9600
 actccggccg cgagggacct gagcgagtcg gcatcgaccg gatcggaaaa cctctcgaga 9660
 aaggcgtcta accagtcaca gtcgcaaggt aggtgagca ccgtggcggg cggcagcggg 9720
 cggcggtcgg ggttggttct ggcggagggt ctgctgatga tgtaattaaa gtaggcggtc 9780
 ttgagacggc ggtaggtcga cagaagcacc atgtccttgg gtccggcctg ctgaatgcgc 9840
 agggcggtcg ccatgcccca ggcttctgtt tgacatcggc gcaggtcttt gtagtagtct 9900
 tgcatgagcc tttctaccgg cacttcttct cttctctctg cttgtctctg atctcttgca 9960
 tctatcgctg cggcgggcgg ggagtttggc cgtaggtggc gccctcttcc tccatgcgt 10020
 gtgaccccgga agccctcat cggctgaagc agggctaggt cggcgacaac gcgctcggct 10080
 aatatggcct gctgcacctg cgtgagggta gactggaagt catccatgtc cacaagcggt 10140
 tggatgcgc ccgtgttgat ggtgtaagt cagttggcca taacggacca gttacgggtc 10200
 tggtagaccg gctgcgagag ctcggtgtac ctgagacgcg agtaagccct cgagtcaaat 10260
 acgtagtcgt tgcaagtcgg caccaggtac tggatccca ccaaaaagt cggcgcgcg

tggcggtaga	ggggccagcg	taggggtggcc	ggggctccgg	gggcgagatc	ttccaacata	10320
aggcgatgat	atccgtagat	gtacctggac	atccaggtga	tgccggcgcc	ggtggtggag	10380
gcgcgcggaa	agtcgcggac	gcggttccag	atgttgcgca	gcggcaaaaa	gtgctccatg	10440
gtcgggagcg	tctggccggg	caggcgcgcg	caatcggtga	cgctctagcg	tgcaaaaagg	10500
gagcctgtaa	gcgggcactc	ttccgtggtc	tgggtgataa	attcgcaagg	gtatcatggc	10560
ggacgaccgg	ggttcgagcc	ccgtatccgg	ccgtcccgcc	tgatccatgc	ggttaccgcc	10620
cgcgtgtcga	accaggtgtg	gcgacgtcag	acaacggggg	agtgtctcct	ttggcttcct	10680
tccaggcgcg	gcggctgctg	cgctagcttt	tttggccact	ggccgcgcgc	agcgtaacga	10740
gttaggctgg	aaagcgaaag	cattaagtgg	ctcgctccct	gtagccggag	ggttattttc	10800
caagggttga	gtcgcgggac	ccccggttcg	agtctcggac	cgcccggaact	gcggcgaaac	10860
gggggtttgcc	tccccgtcat	gcaagacccc	gcttgcaaat	tcctccggaa	acagggacga	10920
gccccctttt	tgcttttccc	agatgcctcc	ggtgctgcgg	cagatgcgcc	cccctcctca	10980
gcagcggcga	gagcaagagc	agcggcagac	atgcagggca	ccctcccttc	ctcctaccgc	11040
gtcaggaggg	gcgacatccg	cggttgacgc	ggcagcagat	ggtgattacg	aacccccgcg	11100
gcgcgcggcc	cggcactacc	tggacttgga	ggaggggcag	ggcctggcgc	ggctaggagc	11160
gcccctctct	gagcgggtacc	caagggtgca	gctgaagcgt	gatacgcgtg	aggcgtacgt	11220
gcccgcggcag	aacctgtttc	gcgaccgcga	gggagaggag	cccgaaggaga	tgccggatcg	11280
aaagtccac	gcagggcgcg	agctgcggca	tggcctgaat	cgcgagcggg	tgctgcgcga	11340
ggaggacttt	gagcccgacg	cgcaaacggg	gattagtccc	gcgcgcgcac	acgtggcgcc	11400
cgccgacctg	gtaaccgcat	acgagcagac	ggtgaaccag	gagattaact	ttcaaaaaag	11460
ctttaacaac	cacgtgcgta	cgcttggggc	gcgcgaggag	gtggctatag	gactgatgca	11520
tctgtgggac	tttgtaagcg	cgctggagca	aaacccaaat	agcaagccgc	tcatggcgca	11580
gctgttcctt	atagtgcagc	acagcaggga	caacgaggca	ttcagggatg	cgctgtctaa	11640
catagttagg	cccagaggcc	gctggctgct	cgatttgata	aacatcctgc	agagcatagt	11700
ggtgcaggag	gcgagcttga	gcctggctga	caagggtggc	gccatcaact	attccatgct	11760
tagcctgggg	aagttttacg	cccgaagat	ataccatacc	ccttacgttc	ccatagacaa	11820
ggaggtaaag	atcgaggggt	tctacatgcg	catggcgctg	aagggtgctta	ccttgagcga	11880
cgacctgggg	gtttatcgca	acgagcgcac	ccacaaggcc	gtgagcgtga	gccgcgcgcg	11940
cgagctcagc	gaccgcgagc	tgatgcacag	cctgcaaaag	gcccctggctg	gcacggggcag	12000
cgcgcatgag	gagggcgagt	cctactttga	cgcgggcgct	gacctgcgct	gggcccccaag	12060
ccgacgcgcc	ctggaggcag	ctggggccgg	acctgggctg	gcggtggcac	ccgcgcgcgc	12120
tggcaacgct	ggcggcgctg	aggaatatga	cgaggacgat	gagtacgagc	cagaggacgg	12180
cgagtactaa	gcgggtgatgt	ttctgatcag	atgatgcaag	acgcaacgga	cccggcggtg	12240
cgggcgcgcc	tcgagagcca	gcccgtccgg	cttaactcca	cgagcagactg	gcgcagagtc	12300
atggaccgca	tcatgtcgct	gactgcgcgc	aatcctgacg	cgctccggca	gcagcccgag	12360
gccaaccggc	tctccgcaat	tctggaagcg	gtggtcccg	cgcgcgcaaa	ccccacgcac	12420
gagaagggtg	tggcgatcgt	aaacgcgctg	gccgaaaaca	gggccatccg	gcccgcagag	12480
gcccgcctg	tctacgacgc	gctgcttcag	cgcggtggctc	gttacaacag	cggaacagtg	12540
cagaccaacc	tggaccggct	ggtgggggat	gtgcgcgagg	ccgtggcgca	gcgtgagcgc	12600
gcgcagcagc	agggcaacct	gggctccatg	gttgactacta	acgccttccct	gagtacacag	12660
cccgcacaac	tgcccgcggg	acaggaggac	tacaccaact	ttgtgagcgc	actgcggcta	12720
atggtgactg	agacaccgca	aagtgaggtg	taccagtctg	ggccagacta	ttttttccag	12780
accagtagac	aaggcctgca	gaccgtaaac	ctgagccagg	ctttcaaaaa	cttgcaaggg	12840
ctgtgggggg	tgccgggctcc	cacagggcag	cgcgcgaccg	tgtctagctt	gctgacgccc	12900
aactgcgcgc	tggtgctgct	gctaatagcg	cccttcacgg	acagtggcag	cggtgtcccg	12960
gacacatacc	taggtcactt	gctgacactg	taccgcgagg	ccataggtca	ggcgcatgtg	13020
gacgagcata	ctttccagga	gattacaagt	gtcagccgcg	cgctggggca	ggaggacacg	13080
ggcagccttg	aggcaaccct	aaactacctg	ctgaccaacc	ggcggcagaa	gatccctcgc	13140
ttgcacagtt	taaacagcga	ggaggagcgc	attttgcgct	acgtgcagca	gagcgtgagc	13200
cttaacctga	tgccgcgacg	ggtaacgccc	agcgtggcgc	tggacatgac	cgcgcgcaac	13260
atggaaccgg	gcatgtatgc	ctcaaacccg	ccgtttatca	accgcctaact	ggactacttg	13320
catcgcgcgg	ccgcccgtgaa	ccccgagtat	ttcaccaatg	ccatcttgaa	cccgcactgg	13380
ctaccgcccc	ctggtttcta	caccggggga	ttcgaggtgc	ccgagggtaa	cgatggattc	13440
ctctgggagc	acatagacga	cagcgtgttt	tccccgcaac	cgagaccctt	gctagagttg	13500
caacagcgcg	agcaggcaga	ggcggcgctg	cgaaaggaaa	gcttcccgag	gccaagcagc	13560
ttgtccgatc	taggcgctgc	ggcccccgcg	tcagatgcta	gtagccattt	tccaagcttg	13620
atagggtctc	ttaccagcac	tcgcaccacc	cgccccgcgc	tgctggcgca	ggaggagtac	13680
ctaaacaact	cgctgctgca	gccgcagcgc	gaaaaaaacc	tgctcccgcc	atttcccaac	13740
aacgggatag	agagcctagt	ggacaagatg	agtagatgga	agacgtacgc	gcaggagcac	13800
agggcagctg	caggcccgcg	cccggcccacc	cgctcgtcaaa	ggcacgaccg	tcagcggggg	13860
ctggtgtggg	aggacgatga	ctcggcgagc	gacagcagcg	tcctggattt	gggaggaggt	13920
ggcaaccctg	ttgcgcacct	tcgccccagg	ctggggagaa	tgttttaaaa	aaaaaaaagc	13980
atgatgcaaa	ataaaaaact	caccaaggcc	atggcaccga	gcgttggttt	tcttgatttc	14040
cccttagtat	gcggcgcgcg	gcgatgtatg	aggaagggtc	tcctccctcc	tacgagagtg	14100
tggtgagcgc	ggcgccagtg	gcggcgcgcg	tgggttctcc	cttcgatgct	cccctggacc	14160
cgcggtttgt	gcctccgcgg	tacctgcggc	ctaccggggg	gagaaacagc	atccgttact	14220

ctgagttggc	acccctattc	gacaccacc	gtgtgtacct	ggtggacaac	aagtcaacgg	14280
atgtggcatc	cctgaactac	cagaacgacc	acagcaactt	tctgaccacg	gtcattcaaa	14340
acaatgacta	cagcccgggg	gaggcaagca	cacagaccat	caatcttgac	gaccggtcgc	14400
actggggcgg	cgacctgaaa	accatcctgc	ataccaacat	gccaaatgtg	aacgagttca	14460
tgttttacaa	taagtttaag	gcgcgggtga	tggtgtcgcg	cttgccctact	aaggacaatc	14520
aggtggagct	gaaatacgag	tgggtggagt	tcacgctgcc	cgagggcaac	tactccgaga	14580
ccatgaccat	agaccttatg	aacaacgcga	tcgtggagca	ctacttgaaa	gtgggcagac	14640
agaacggggt	tctggaaaag	gacatcgggg	taaagtttga	cacccgcaac	ttcagactgg	14700
ggtttgacc	cgctcactgt	cttgtcatgc	ctgggttata	tacaaacgaa	gccttccatc	14760
cagacatcat	tttgctgcca	ggatgctggg	tggacttcac	ccacagccgc	ctgagcaact	14820
tgttgggcat	ccgcaagcgg	caacccttcc	aggagggttt	taggatcacc	tacgatgatc	14880
tggagggttg	taacattccc	gactgttggt	atgtggacgc	ctaccaggcg	agcttgaaag	14940
atgacaccga	acagggcggg	ggtggcgag	gcggcagcaa	cagcagtggc	agcggcgccg	15000
aagagaactc	caacgcggca	gccgcggcaa	tgcagccggt	ggaggacatg	aacgatcatg	15060
ccattcgccg	cgacaccttt	gccacacggg	ctgaggagaa	gcgcgctgag	gccgaagcag	15120
cggccgaagc	tgccgcccc	gctgcgcaac	ccgaggtcga	gaagcctcag	aagaaacccg	15180
tgatcaaaac	cctgacagag	gacagcaaga	aacgcagtta	caaccttaata	agcaatgaca	15240
gcaccttcac	ccagtaccgc	agctggtacc	ttgcatacaa	ctacggcgac	cctcagaccg	15300
gaatccgctc	atggaccctg	ctttgcactc	ctgacgtaac	ctgcggtctg	gagcaggtct	15360
actggtcgtt	gccagacatg	atgcaagacc	ccgtgacctt	ccgctccacg	cgccagatca	15420
gcaactttcc	ggtgggtggg	gccgagctgt	tgcccgtgca	ctccaagagc	ttctacaacg	15480
accaggccgt	ctactcccaa	ctcatccgcc	agtttacctc	tctgaccac	gtgttcaatc	15540
gctttcccg	gaaccagatt	ttggcgccgc	cgccagcccc	caccatcacc	accgtcagtg	15600
aaaacgttcc	tgctctcaca	gatcacggga	cgctaccgct	gcgcaacagc	atcggaggag	15660
tccagcgagt	gaccattact	gacgccagac	gccgcacctg	cccctacgtt	tacaagcccc	15720
tgggcatagt	ctcgccgcgc	gtcctatcga	gccgcacttt	ttgagcaagc	atgtccatcc	15780
ttatatcgcc	cagcaataac	acaggctggg	gcttgcgctt	cccaagcaag	atgtttggcg	15840
ggggcaagaa	gcgctccgac	caacaccag	tgccgctggg	cgggcactac	cgccgcccct	15900
ggggcgcgca	caaacgcggc	cgcactgggc	gcaccaccgt	cgatgacgcc	atcgacgcgg	15960
tgggtggagga	ggcgcgcaac	tacacgcccc	cgccgccacc	agtgtccaca	gtggacgcgg	16020
ccattcagac	cgtggtgcgc	ggagcccggc	gctatgctaa	aatgaagaga	cgcgcgaggc	16080
gcgtagcacg	tcgccaccgc	cgccgacccg	gcactgccgc	ccaacgcgcg	gcggcgggccc	16140
tgcttaaccg	cgcacgtcgc	accggccgac	ggggcgccat	gcggggccgt	cgaaggctgg	16200
ccgcgggtat	tgctactgtg	ccccccaggt	ccaggcgacg	agcggccgcc	cgacgacccg	16260
cgcccattag	tgctatgact	cagggtcgca	ggggcaacgt	gtattgggtg	cgcgactcgg	16320
ttagcggcct	gcgcgtgccc	gtgcgcaccc	gccccccgcg	caactagatt	gcaagaaaaa	16380
actacttaga	ctcgtactgt	tgtatgtatc	cagcggcggc	ggcgcgcaac	gaagctatgt	16440
ccaagcgcaa	aatcaaaaga	gagatgctcc	aggtcatcgc	gccggagatc	tatggccccc	16500
cgaagaagga	agagcaggat	tacaagcccc	gaaagctaaa	gcgggtcaaa	aagaaaaaga	16560
aagatgatga	tgatgaactt	gacgacgagg	tggaaactgct	gcacgctacc	gcgcccaggc	16620
gacgggtaca	gtggaaaagt	cgacgcgtaa	aacgtgtttt	gcgacccggc	accaccgtag	16680
tctttacgcc	cggtgagcgc	tccaccgcga	cctacaagcg	cgtgtatgat	gaggtgtacg	16740
gcgacgagga	cctgcttgag	caggccaacg	agcgcctcgg	ggagtgtgcc	tacggaaaagc	16800
ggcataagga	catgctggcg	ttgccgctgg	acgagggcaa	cccaacacct	agcctaaaagc	16860
ccgtaacact	gcagcaggtg	ctgcccgcgc	ttgcaccgtc	cgaagaaaaa	cgcgccctaa	16920
agcgcgagtc	tgggtgacttg	gcaccacccg	tgcagctgat	ggtacccaag	cgccagcgac	16980
tggaaagtgt	cttggaaaaa	atgaccgtgg	aacctgggct	ggagcccag	gtccgcgtgc	17040
ggccaatcaa	gcaggtggcg	ccgggactgg	gcgtgcagac	cgtggacgtt	cagataccca	17100
ctaccagtag	caccagtatt	gccaccgcca	cagagggcat	ggagacacaa	acgtcccccg	17160
ttgcctcagc	ggtggcggat	gccgcggtgc	aggcggctgc	tgccggccgcg	tccaagacct	17220
ctacggagggt	gcaaacggac	ccgtggatgt	ttcgcgtttc	agcccccccg	cgccccgcgcg	17280
gttcgaggaa	gtacggcgcc	gccagcgcg	tactgcccga	atatgcccta	catccttcca	17340
ttgcgcctac	ccccggctat	cgtggctaca	cctaccgccc	cagaagacga	gcaactaccc	17400
gacgccgaac	caccactgga	acccgccgcg	gccgtcgccg	tcgccagccc	gtgctggccc	17460
cgattttccgt	gcgcagggtg	gctcgcgaag	gaggcaggac	cctggtgctg	ccaacagcgc	17520
gctaccaccc	cagcatcggt	taaaagccgg	tctttgtggt	tcttgagat	atggccctca	17580
cctgccgcct	ccgtttcccg	gtgccgggat	tccgaggaa	aatgcaccgt	aggaggggca	17640
tggccggcca	cgccctgacg	ggcggcctgc	gtcgtgcgca	ccaccggcgg	cgccgcgcgt	17700
cgcaccgtcg	catgcgcggc	ggtatcctgc	ccctccttat	tccactgatc	gcccgggcga	17760
ttggcgccgt	gcccgaatt	gcatccgtgg	ccttgacagg	gcagagacac	tgattaaaaa	17820
caagttgcat	gtggaaaaat	caaaaataaaa	agtctggact	ctcacgctcg	cttggtcctg	17880
taactatttt	gtagaatgga	agacatcaac	tttgcgtctc	tgcccccgcg	acacggctcg	17940
cgcccggttca	tgggaaactg	gcaagataac	ggcaccagca	atatgagcgg	tggcgccctc	18000
agctggggct	cgctgtggag	cggcattaaa	aatttcggtt	ccaccgttaa	gaactatggc	18060
agcaaggcct	ggaacagcag	cacaggccag	atgctgaggg	ataagttgaa	agagcaaaat	18120
ttccaacaaa	aggtggtaga	tggcctggcc	tctggcatta	gcggggtggt	ggacctggcc	18180

aaccaggcag	tgcaaaataa	gattaacagt	aagcttgatc	cccgccctcc	cgtagaggag	18240
cctccaccgg	ccgtggagac	agtgtctcca	gagggcgctg	gcgaaaagcg	tccgcgcccc	18300
gacagggaaag	aaactctggg	gacgcaataa	gacgagcctc	cctcgtagca	ggaggcacta	18360
aagcaaggcc	tgcccaccac	ccgtcccac	gcgcccattg	ctaccggagt	gctgggcccag	18420
cacacaccgg	taacgctgga	cctgcctccc	cccgccgaca	cccagcagaa	acctgtgtctg	18480
ccaggcccgga	ccgcccgtgt	tgtaacccgt	cctagccgcg	cgccccctgc	ccgcgcgcgc	18540
agcgggtccgc	gatcgttgcg	gcccgtagcc	agtggcaact	ggcaaaagcag	actgaacagc	18600
atcgtgggtc	tgggggtgca	atccctgaag	cgccgacgat	gcttctgaat	agctaactgt	18660
tcgtatgtgt	gtcatgtatg	cgcccatgtc	gcccgcagag	gagctgtctga	gcccgcgcgc	18720
gcccgcctttc	caagatggct	accccttcga	tgatgccgca	gtggtcttac	atgcacatct	18780
cgggccagga	cgccctcgag	tacctgagcc	ccgggctggg	gcagtttgcc	cgccgccaccg	18840
agacgtactt	cagcctgaat	aacaagttta	gaaacccac	ggtggcgct	acgcacgacg	18900
tgaccacaga	ccggtcccag	cgtttgacgc	tgcggttcat	ccctgtggac	cgtagggata	18960
ctgcgtactc	gtacaaggcg	cggttcaccc	tagctgtggg	tgataaacct	gtgtcggaca	19020
tggtctccac	gtactttgac	atccgcggcg	tgctggacag	gggcccact	tttaagccct	19080
actctggcac	tgccctacaac	gccctggctc	ccaagggtgc	cccaaatcct	tgcgaaatgg	19140
atgaagctgc	tactgctctt	gaaataaacc	tagaagaaga	ggacgatgac	aacgaagacg	19200
aagtagacga	gcaagctgag	cagcaaaaaa	ctcacgtatt	tgggcaggcg	ccttattctg	19260
gtataaatat	tacaaaggag	ggtattcaaa	taggtgtcga	aggtcaaaca	cctaaatatg	19320
ccgataaaac	atttcaacct	gaacctcaaa	taggagaatc	tcagtggtag	gaaactgaaa	19380
ttaatcatgc	agctgggaga	gtccttaaaa	agactacccc	aatgaaacca	tggtacgggt	19440
catatgcaaa	acccacaaat	gaaaatggag	ggcaaggcat	tcttgtaaag	caacaaaatg	19500
gaaagctaga	aagtcaagtg	gaaatgcaat	ttttctcaac	tactgaggcg	accgcaggca	19560
atggtgataa	cttgactcct	aaagtggtag	tgtacagtga	agatgtagat	atagaaccc	19620
cagacactca	tatttcttac	atgccacta	ttaaaggaa	taactcacga	gaactaatgg	19680
gccacaacac	tatgcccaac	aggcctaatt	acattgcttt	tagggacaat	tttattggtc	19740
taatgtatta	caacagcacg	ggtaatatgg	gtgttctggc	gggccaagca	tcgcagttga	19800
atgctgttgt	agatttgcaa	gacagaaaca	cagagctttc	ataccagctt	ttgcttgatt	19860
ccattgggtga	tagaaccagg	tacttttcta	tgtggaatca	ggctgttgac	agctatgatc	19920
cagatgttag	aattattgaa	aatcatggaa	ctgaagatga	acttccaaat	tactgctttc	19980
cactgggagg	tgtgattaat	acagagactc	ttaccaaggt	aaaacctaaa	acaggtcagg	20040
aaaatggatg	ggaaaaagat	gctacagaat	tttcagataa	aaatgaaata	agagttggaa	20100
ataattttgc	catggaaatc	aatctaaatg	ccaacctgtg	gagaaaatttc	ctgtactcca	20160
acatagcgct	gtatttgccc	gacaagctaa	agtacagtcc	ttccaacgta	aaaattttctg	20220
ataacccaaa	cacctacgac	tacatgaaca	agcgagtggg	ggctcccggg	ttagtggact	20280
gctacattaa	ccttgagaca	cgctggctcc	ttgactatat	ggacaacgtc	aacccattta	20340
accaccaccg	caatgctggc	ctgcgctacc	gtcfaatgtt	gctgggcaat	ggtcgctatg	20400
tgccctttcca	catccagggtg	cctcagaagt	tctttgccat	taaaaacctc	cttctcctgc	20460
cgggctcata	cacctacgag	tggaacttca	ggaaggatgt	taacatgggt	ctgcagagct	20520
ccctaggaaa	tgacctaaag	gttgacggag	ccagcattaa	gtttgatagc	atttgccctt	20580
acgccacctt	cttccccatg	gcccacaaca	ccgcctccac	gcttgaggcc	atgcttagaa	20640
acgacaccaa	cgaccagtcc	tttaacgact	atctctccgc	cgccaacatg	ctctacccta	20700
taccgcgcaa	cgctaccaac	gtgcccatat	ccatcccttc	ccgcaactgg	gcggctttcc	20760
gcggctgggg	cttcacgcgc	cttaagacta	aggaaaaccc	atcactgggc	tcgggctacg	20820
acccttatta	cacctactct	ggctctatac	cctacctaga	tggaaccttt	tacctcaacc	20880
acacctttaa	gaagtgggcc	attacctttg	actcttctgt	cagctggcct	ggcaatgacc	20940
gcctgcttac	ccccaacgag	tttgaaatta	agcgctcagt	tgacggggag	ggttacaacg	21000
ttgcccagtg	taacatgacc	aaagactggg	tcctggtaca	aatgctagct	aactacaaca	21060
ttggctacca	gggcttctat	atcccagaga	gctacaagga	ccgcatgtac	tccttcttta	21120
gaaactttcca	gcccattgagc	cgctcaggtg	tggtatgatac	taaatacaag	gactaccaac	21180
aggtggggcag	cctacaccaa	cacaacaact	ctggatttgt	tggctacctt	gccccacca	21240
tgcgcggaag	acaggccctac	cctgctaact	tcccctatcc	gcttataggc	aagaccgcag	21300
ttgacagcat	taccagaaaa	aagtttcttt	gcgatcgcac	cctttggcgc	atccccattct	21360
ccagtaactt	tatgtccatg	ggcgactca	cagacctggg	ccaaaacctt	ctctacgcca	21420
actccgcccc	cgcgctagac	atgacttttg	aggtggatcc	catggacgag	cccacccttc	21480
tttatgtttt	gtttgaagtc	tttgacgtgg	tccgtgtgca	ccggccgcac	cgcgccgtca	21540
tcgaaacctg	gtacctgcgc	acgcccttct	cgcccggaac	cgccacaaca	taagaaagca	21600
agcaacatca	acaacagctg	ccgccatggg	ctccagttag	caggaactga	aagccattgt	21660
caaagatctt	ggttggtggc	catttttttt	gggcacctat	gacaagcgct	ttccaggctt	21720
tggtttctcca	cacaagctcg	cttcgcgcat	agtcacatag	gccggctcgc	agactggggg	21780
cgtagactgg	atggcctttg	cctggaaccc	gcactcaaaa	acatgctacc	tctttgagcc	21840
ctttggcttt	tctgaccagc	gactcaagca	ggtttaccag	tttgagtacg	agtcactcct	21900
gcgcgcgtagc	gccattgctt	cttcccccca	ccgctgtata	acgctggaaa	agtcaccacca	21960
aagcgtacag	gggcccacac	ctggcgcctg	tggactattc	tgctgcatgt	ttctccacgc	22020
ctttgccaac	tgcccccaaa	ctcccatgga	tcacaacccc	accatgaacc	ttattaccgg	22080
ggtacccaac	tccatgctca	acagtcccca	ggtacagccc	accctgcgtc	gcaaccagga	22140

acagctctac	agcttcctgg	agcgccactc	gccctacttc	cgcagccaca	gtgcgcagat	22200
taggagcgcc	acttcttttt	gtcacttgaa	aaacatgtaa	aaataatgta	ctagagacac	22260
tttcaataaa	ggcaaatgct	tttatttgta	cactctcggg	tgattattta	ccccaccct	22320
tgccgtctgc	gccgtttaaa	aatcaaaagg	gttctgcccc	gcatcgctat	gcgccactgg	22380
caggagacag	ttgcgatact	ggtgtttagt	gctccactta	aactcaggca	caaccatccg	22440
cggcagctcg	gtgaagtttt	cactccacag	gctgcgcacc	atcaccaacg	cgtttagcag	22500
gtcggggcgcc	gatatcttga	agtcgcagtt	ggggcctccg	ccctgcgcgc	gcgagttgcg	22560
atacacaggg	ttgcagcact	ggaacactat	cagcgccggg	tggtgcacgc	tggccagcac	22620
gctcttgctg	gagatcagat	ccgcgtccag	gtcctccgcg	ttgctcaggg	cgaacggagt	22680
caactttggt	agctgccttc	ccaaaaagg	cgcgtgccca	ggctttgagt	tgcactcgca	22740
ccgtagtgcc	atcaaaaagg	gaccgtgccc	ggtctggggc	ttaggataca	gcgcctgcat	22800
aaaagccttg	atctgcttaa	aagccacctg	agcctttgcg	ccttcagaga	agaacatgcc	22860
gcaagacttg	ccggaaaact	gattggccgg	acaggcccg	tcgtgcacgc	agcaccttgc	22920
gtcgggtgtg	gagatctgca	ccacatttcg	gccccaccgg	ttcttcacga	tcttggtcct	22980
gctagactgc	tccttcagcg	cgcgctgccc	gttttcgctc	gtcacatcca	tttcaatcac	23040
gtgctcctta	tttatcataa	tgcttcgctg	tagacactta	agctcgcttc	cgatctcagc	23100
gcagcgggtg	agccacaacg	cgcagccggt	gggctcgtga	tgcttgtagg	tcacctctgc	23160
aaacgactgc	aggtacgcct	gcaggaaatc	ccccatcatc	gtcacaaaag	tcttggtgct	23220
ggtgaagggt	agctgcaacc	cgcgggtgct	ctcggttcagc	caggtcttgc	atacggccgc	23280
cagagcttcc	acttggtcag	gcagtagttt	gaagttcgcc	tttagatcgt	tatccacgtg	23340
gtacttgctc	atcagcgcg	gcgcagcctc	catgcccttc	tcccacgcag	acacgactcg	23400
cacactcagc	gggttcacat	ccgtaatttc	actttccgct	tcgctgggct	cttctctctc	23460
ctcttgctgc	cgcataccac	gcgccactgg	gtcgctctca	ttcagccgcc	gcactgtgcg	23520
cttacctcct	ttgccatgct	tgattagcac	cggtgggttg	ctgaaaccca	ccatttgtag	23580
cgccacatct	tctctttctt	cctcgctgct	cacgattacc	tctggtgatg	gcggggcgctc	23640
gggcttgggg	gaaggcgct	tctttttctt	cttggggcga	atggccaaat	ccgccgcgca	23700
ggtcgatggc	cgcgggctgg	gtgtgcgcgg	caccagcgcg	tcttgatgat	agtcttctct	23760
gtcctcgga	tcgatacgcc	gcctcatccg	cttttttggg	ggcgcccggg	gaggcgcgcg	23820
cgacggggag	ggggacgaca	cgctctccat	ggttggggga	cgctcgcccg	caccgcgtcg	23880
gcgctcgggg	gtggtttcgc	gctgctctc	ttcccgactg	gccatttctc	tctctctatg	23940
gcagaaaaag	atcatggagt	cagtcgagaa	gaaggacagc	ctaaccgccc	cctctgagtt	24000
cgccaccacc	gcctccaccg	atgccgcaa	cgcgcctacc	accttccccg	tcgaggcacc	24060
cccgttgtag	gaggaggaag	tgattatcga	gcaggaccca	ggttttgtaa	gcgaagacga	24120
cgagaccgcg	tcagtaacca	cagaggataa	aaagcaagac	caggacaacg	cagaggcaaa	24180
cgaggaaaca	gtcgggcggg	gggacgaaa	gcatggcgac	tacctagatg	tgggagacga	24240
cgtgctgttg	aagcatctgc	agcgccagtg	cgccattatc	tgcgacgcgt	tgcaagagcg	24300
cagcgtgtgt	cccctcgcca	tagcggtagt	cagccttgcc	tacgaacgcc	acctattctc	24360
accgcgcgta	cccccaaac	gccaagaaaa	cggcacatgc	gagcccaacc	cgcgccctaa	24420
cttctaccgc	gtatttgccg	tgccagaggt	gcttgccacc	tatcacatct	ttttccaaaa	24480
ctgcaagata	cccctatcct	gccgtgccaa	ccgcagccga	gcggacaagc	agctggcctt	24540
gcggcagggc	gctgtcatat	ctgatctcgc	ctcgctcaac	gaagtgccaa	aaatctttga	24600
gggtcttgga	cgcgacgaga	agcgcgcgcc	aaacgctctg	caacaggaaa	acagcgaaaa	24660
tgaaaagtcat	tctggagtgt	tggtggaact	cgagggtgac	aacgcgcgcc	tagccgtact	24720
aaaacgcagc	atcgaggtca	cccactttgc	ctaccgggca	cttaacctac	cccccaagg	24780
catgagcaca	gtcatgagtg	agctgatcgt	gcgcctgctg	cagccccctg	agagggatgc	24840
aaatttgcaa	gaacaaacag	aggaggccct	acccgcagtt	ggcgacgagc	agctagcgcg	24900
ctggcttcaa	acgcgcgagc	ctgccgactt	ggaggagcga	cgcaaaacta	tgatggccgc	24960
agtgtcgtgt	accgtggagc	ttgagtgcac	gcagcggttc	tttgtgacc	cggagatgca	25020
gcgcaagcta	gaggaaacat	tgcaactcac	ctttcgacag	ggctacgtac	gccaggcctg	25080
caagatctcc	aacgtggagc	tctgcaacct	ggtctcctac	cttgggaatt	tgcaagaaaa	25140
ccgccttggt	caaaacgtgc	ttcattccac	gctcaagggc	gaggcgcgcc	gcgactacgt	25200
ccgcgactgc	gtttacttat	ttctatgcta	cacctggcag	acggccatgg	gcgtttggca	25260
gcagtgtgtg	gaggagtgc	acctcaagg	gctgcagaaa	ctgctaaagc	aaaacttgaa	25320
ggacctatgg	acggccttca	acgagcgctc	cggtggccgg	cacctggcgg	acatcatttt	25380
ccccgaacgc	ctgcttaaaa	ccctgcaaca	gggtctgcca	gacttcacca	gtcaaagcat	25440
gttgcaaac	tttaggaact	ttatcttaga	gcgctcagga	atcttgcccg	ccacctgctg	25500
tgacttctct	agcgactttg	tgcccattaa	gtaccgcgaa	tgccctccgc	cgctttgggg	25560
ccactgctac	cttctgcagc	tagccaacta	ccttgccctac	cactctgaca	taatggaaag	25620
cgtgagcggg	gacggtctac	tggagtgtca	ctgtcgctgc	aacctatgca	ccccgcaccg	25680
ctccctgggt	tgcaattcgc	agctgcttaa	cgaaaagtcaa	attatcggtg	cctttgagct	25740
gcagggtccc	tcgcctgacg	aaaagtccgc	ggctccgggg	ttgaaactca	ctccggggct	25800
gtggacgtcg	gcttaccttc	gcaaatttgt	acctgaggac	taccacgccc	acgagattag	25860
gttctacgaa	gaccaatccc	gcccccaaaa	tgcgagcttt	accgcctgcg	tcattaccaca	25920
ggggcacatt	cttgcccaat	tgcaagccat	caacaaagcc	cgccaagagt	ttctgtctacg	25980
aaaggagcgg	ggggtttact	tggaccacca	gtccggcgag	gagctcaacc	caatcccccc	26040
gccgccgcag	ccctatcagc	agcagcccg	ggcccttgct	tcccaggatg	gcacccaaaa	26100

agaagctgca gctgccgccc ccacccacgg acgaggagga atactgggac agtcaggcag 26160
 aggaggtttt ggacgaggag gaggaggaca tgatggaaga ctgggagagc ctagacgagg 26220
 aagcttccga ggtcgaaagag gtgtcagacg aaacaccgtc accctcggtc gcattcccct 26280
 cgccggcgcc ccagaaatcg gcaaccgggt ccagcatggc tacaacctcc gtcctcagg 26340
 cgccggcgcc actgcccggt cgccgaccca accgtagatg ggacaccact ggaaccaggg 26400
 ccggtaagtc caagcagccg ccgcccgttag cccaagagca acaacagcgc caaggctacc 26460
 gctcatggcg cgggcacaa gacgcccata ttgcttgctt gcaagactgt gggggcaaca 26520
 tctccttcgc ccgcccgttt cttctctacc atcacggcgt ggccctcccc cgtaacatcc 26580
 tgcattacta ccgtcatctc tacagcccat actgcaccgg cggcagcggc agcggcagca 26640
 acagcagcgg ccacacagaa gcaaaaggcg ccgcatagca agactctgac aaagcccaag 26700
 aaatccacag cgggggcagc agcaggagga ggagcgctgc gtctggcgcc caacgaaccc 26760
 gtatcgaccc gcgagcttag aaacaggatt ttccctactc tgtatgtat atttcaacag 26820
 agcaggggcc aagaacaaga gctgaaaata aaaaacaggc ctctgcgac cctcaccgcg 26880
 agctgcctgt atcacaaaag cgaagatcag cttcgggcca cgctggaaga cgcggaggct 26940
 ctcttcagta aatactgcgc gctgactctt aaggactagt ttcgcccctt ttctcaaat 27000
 taagcgcgaa aactacgtca tctccagcgg ccacaccggc cggcagcacc tctcgtcagc 27060
 gccattatga gcaaggaaat tcccacgccc tacatgtgga gttaccagcc acaaatggga 27120
 cttgcggtcg gagctgccc aagactactca acccgaataa actacatgag cgcgggaccc 27180
 cacatgatat ccggggtaaa cggaatccgc gccaccgaa accgaattct cttggaacag 27240
 gcggctatta ccaccacacc ctgtaataac cttaatcccc gtagtggcc cgctgccctg 27300
 gtgtaccagg aaagtccgc tcccaccact gtggacttc ccagagacgc ccaggccgaa 27360
 gttagatga ctaactcagg ggcgcagctt gcggcggtt ttcgtcacag ggtgcggtcg 27420
 ccggggcagg gtataactca cctgacaatc agagggcgag gtattcagct caacgacgag 27480
 tcggtgagct cctcgcttgg tctccgctcg gacgggacat ttcagatcgg cggcgccggc 27540
 cgtccttcac tcacgcctcg tcaggcaatc ctaactctgc agacctcgtc ctctgagccg 27600
 cgctctggag gcattggaac tctgcaattt attgaggagt ttgtgccatc ggtctacttt 27660
 aaccccttct cgggacctcc cggccactat ccggatcaat ttattcctaa ctttgacgcg 27720
 gtaaaaggact cggcgagcgg ctacgactga taattaagt gagaggcaga gcaactgcgc 27780
 ctgaaacacc tgggtccact gcgcgcccac aagtgccttg ccgcgactc cgttgagttt 27840
 tgctactttg aattgcccga ggatcatatc gaggatcttt gttgccatct ctgtgctgag 27900
 tataataaat acagaaatta aaatatactg gggctcctat cgcatcctg taaacgccac 27960
 cgtcttcacc cgcccaagca aaccaaggcg aaccttacct ggtactttta acatctctcc 28020
 ctctgtgatt tacaacagtt tcaacccaga cggagttagt ctacgagaga acctctccga 28080
 gctcagctac tccatcagaa aaaaaccac cctccttacc tgcggggaac gtacccttaa 28140
 ttaaaagtca ggcttctctg atgtcagcat ctgactttgg ccagcacctg tcccgcggat 28200
 ttgttccagt ccaactacag cgacccaccc taacagagat gaccaacaca accaacgcgg 28260
 ccgcccgtac cggacttaca tctaccaca atacaccca agtttctgcc ttgttcaata 28320
 actgggataa cttgggcatg tgggtgttct ccatagcgct tatgtttgta tgccttatta 28380
 ttatgtggct catctgctgc ctaaagcgca aacgcgccc accacccatc tatagtccca 28440
 tcattgtgct acacccaac aatgatgga tccatagatt ggacggactg aaacacatgt 28500
 tcttttctct tacagtatga ttaaatgaga ttaattaaagg aatttctgtc cagtttattc 28560
 agcagcacct ccttgccctc ctcccagctc tggatttga gcttccctct ggctgcaaac 28620
 ttctccaca atctaaatgg aatgtcagtt tctcctgtt cctgtccatc cgcacccact 28680
 atcttcatgt tgttcagat gaagcgcgca agaccgtctg aagatacctt caaccccgtg 28740
 tatccatag acacggaaac cggctctcca actgtgcctt ttcttactcc tccctttgta 28800
 tcccccaatg ggtttcaaga gagtccccct ggggtactct ctttgcgct atccgaaact 28860
 ctagttaact ccaatggcat gcttgcgctc aaaaatggga acggcctctc tctggacgag 28920
 gccggcaacc ttacctcca aaatgtaacc actgtgagcc cacctctcaa aaaaaccaag 28980
 tcaaacataa acctggaat atctgcaccc ctcacagtta cctcagaagc cctaactgtg 29040
 gctgcgcccg cacctctaag ggtcggggc aacacactca ccatgcaatc acaggccccg 29100
 ctaaccgtgc acgactcca acttagcatt gccaccaag gaccctcac agtgtcagaa 29160
 ggaaagctag ccctgcaaac atcaggcccc ctcaccacca ccgatagcag tacccttact 29220
 atcactgcct caccctctt aactactgcc actggtagct tgggcattga cttgaaagag 29280
 cccatttata caaaaaatg aaaaactagga ctaaaagtac gggctccttt gcatgtaaca 29340
 gacgacctaa acactttgac cgtagcaact ggtccagggt tgactattaa taactctcc 29400
 ttgcaacta aagttactgg agccttgggt tttgattcac aaggcaatat gcaacttaat 29460
 gtagcaggag gactaaggat tgattctcaa aacagacgcc ttatacttga tgttagttat 29520
 ccggttgatg ctcaaaacca actaaatcta agactaggac agggccctct tttataaac 29580
 tcagcccaca acttgatata taactacaac aaaggccttt acttgtttac agcttcaaac 29640
 aattccaaaa agcttgaggt taacctagc actgccaagg ggttgatgtt tgacgctaca 29700
 gccatagcca ttaatgcagg agatgggctt gaatttgggt cacctaagtc accaaacaca 29760
 aatcccctca aaacaaaaat tggccatggc ctagaatttg attcaaacaa ggctatgggt 29820
 cctaaactag gaactggcct tagttttgac agcacagggt ccattacagt aggaacaaaa 29880
 aataatgata agctaacttt gtggaccaca ccagctccat ctcctaactg tagactaaat 29940
 gcagagaaaag atgctaaact cactttgggtc ttaacaaaat gtggcagtc aatacttgct 30000
 acagtttcag ttttggctgt taaaggcagt ttggctccaa tatctggaac agttcaaaag 30060

```

gctcatctta ttataagatt tgacgaaaaat ggagtgctac taaacaattc cttcctggac 30120
ccagaatatt ggaacttttag aaatggagat cttactgaag gcacagccta tacaaaacgt 30180
gtttgattta tgcctaaccct atcagcttat ccaaaatctc acggtaaaac tgccaaaagt 30240
aacattgtca gtcaagttta cttaaacgga gacaaaacta aacctgtaac actaaccatt 30300
acactaaacg gtacacagga aacaggagac acaactccaa gtgcatactc tatgtcattt 30360
tcattgggact ggtctggcca caactacatt aatgaaatat ttgccacatc ctcttacact 30420
ttttcatata ttgcccaga ataaagaatc gtttgtgta tgtttcaacg tgtttatttt 30480
tcaattgcag aaaatttcaa gtcatttttc attcagtagt atagccccac caccacatag 30540
cttatacaga tcaccgtacc ttaatcaaac tcacagaacc ctagtattca acctgccacc 30600
tccctcccaa cacacagagt acacagtcct ttctccccgg ctggccttaa aaagcatcat 30660
atcatgggta acagacatat tcttaggtgt tatattccac acggtttcct gtcgagccaa 30720
acgctcatca gtgatatata taaactcccc gggcagctca cttaagtcca tgtcgtgtc 30780
cagctgtcga gccacaggct gctgtccaac ttgcggtgc ttaacgggag gcgaaggaga 30840
agtccacgcc tacatggggg tagagtcata atcgtgcatac aggatagggc ggtggtgctg 30900
cagcagcgcg cgaataaaact gctgccgcgc ccgctccgtc ctgcaggaat acaacatggc 30960
agtgtctctc tcagcgatga ttgcgacgcg ccgcagcata aggcgccttg tctccgggc 31020
acagcagcgc acctgatct cacttaaatc agcacagtaa ctgcagcaca gcaccacaat 31080
attgttcaaa atcccacagt gcaaggcgct gtatccaaag ctcatggcgg ggaccacaga 31140
acccacgtgg ccatcatacc acaagcgtag gtagattaag tggcgacccc tcataaacac 31200
gctggacata aacattacct cttttggcat gttgtaattc accacctccc ggtaccatat 31260
aaacctctga ttaaacatgg cgccatccac caccatccta aaccagctgg ccaaaacctg 31320
cccgccggct atactgca ggaacccggg actggaacaa tgacagtggg gagcccagg 31380
ctcgtaacca tggatcatca tgcctgctcat gatataatg ttggcacaac acaggcacac 31440
gtgcatacac ttctcagga ttacaagctc ctcccgctt agaaccatat cccagggaac 31500
aaccctattc tgaatcagcg taaatccac actgcaggga agacctcgca cgtaactcac 31560
gttgtgcatt gtcaaagtgt tacattcggg cagcagcgga tgatcctcca gtatggtagc 31620
gcgggtttct gtctcaaaag gaggtagacg atccctactg tacggagtgc gccgagacaa 31680
ccgagatcgt gttggtcgta gtgtcatgcc aaatggaacg ccggacgtag tcatatttcc 31740
tgaagcaaaa ccaggtgcgg gcgtgacaaa cagatctgcg tctccggtct cgccgcttag 31800
atcgctctgt gtagtagttg tagtatatcc actctctcaa agcatccagg cgccccctgg 31860
cttcgggttc tatgtaaact ccttcatgcg ccgctgccct gataacatcc accaccgag 31920
aataagccac acccagccaa cctacacatt cgttctgcga gtcacacacg ggaggagcgg 31980
gaagagctgg aagaaccatg tttttttttt tattccaaaa gattatccaa aacctcaaaa 32040
tgaagatcta ttaagtgaac gcgctcccc cgggtggcgt ggtcaaaact tacagccaaa 32100
gaacagataa tggcatttgt aagatgttgc acaatggctt ccaaaaggca aacggccctc 32160
acgtccaagt ggacgtaaag gctaaacctc tcagggtgaa tctcctctat aaacattcca 32220
gcaccttcaa ccatgcccaa ataattctca tctcgccacc ttctcaatat atctctaagc 32280
aaatcccgaa tattaagtcc ggccattgta aaaatctgct ccagagcgcc ctccacctc 32340
agcctcaagc agcgaatcat gattgcaaaa attcaggttc ctacagacc tgtataagat 32400
tcaaaagcgg aacattaaca aaaataccgc gatcccgtag gtcccttcgc agggccagct 32460
gaacataatc gtgcaggtct gcacggacca gcgcggccac ttccccgcca ggaaccttga 32520
caaaagaacc cacactgatt atgacacgca tactcgagc tatgctaacc agcgtagccc 32580
cgatgtaagc tttgttgcatt gggcgcgcat ataaaatgca aggtgctgct caaaaaatca 32640
ggcaaaagcct cgcgcaaaaa agaaagcaca tcgtagtcat gctcatgcag ataaaggcag 32700
gtaagctccg gaaccaccac agaaaaagac accatttttc tctcaaacat gtctgcggt 32760
ttctgcataa acacaaaata aaataacaaa aaaacattta aacattagaa gcctgtctta 32820
caacaggaaa aacaacctt ataagcataa gacggactac ggccatgccg gcgtgaccgt 32880
aaaaaaactg gtcaccgtga ttaaaaagca ccaccgacag ctccctcggtc atgtccggag 32940
tcataatgta agactcggtg aacacatcag gttgattcat cggtcagtgc taaaaagcga 33000
ccgaaatagc ccgggggaat acataccgcg aggcgtagag acaacattac agccccata 33060
ggaggtataa caaaaattaat aggagagaaa aacacataaa cacctgaaaa accctctgc 33120
ctaggcaaaa tagcaccctc ccgctccaga acaacataca gcgcttcaca gcggcagcct 33180
aacagtcagc cttaccagta aaaaagaaaa cctattaaaa aaacaccact cgacacggca 33240
ccagctcaat cagtcacagt gtaaaaaagg gccaaagtga gagcgagtat atataggact 33300
aaaaaatgac gtaacgggta aagtccacaa aaaacaccca gaaaaccgca cgcgaaacct 33360
cgccagaaaa cgaaagccaa aaaaccacaa acttctctca atcgtcactt ccgttttccc 33420
acgttacgta acttcccatt ttaagaaaac tacaattccc aacacataca agttactccg 33480
ccctaaaacc tacgtcaccc gccccgttcc cagcccccgc gccacgtcac aaactccacc 33540
ccctcattat catattggct tcaatccaaa ataaggtata ttattgatga tg 33592

```

<210> 2

<211> 34341

<212> DNA

<213> Adenovirus subgroup C

<400> 2

```

catcatcaat aatatacctt attttgatt gaagccaata tgataatgag ggggtggagt 60
ttgtgacgtg gcgcggggcg tgggaacggg gcgggtgacg tagtagtgtg gcggaagtgt 120
gatgttgcaa gtgtggcgga acacatgtaa gcgacggatg tggcaaaagt gacgtttttg 180
gtgtgcccgc gtgtacacag gaagtgaaca ttttcgcgcg gttttaggcg gatgtttag 240
taaatttggg cgtaacccag taagatttgg ccattttcgc gggaaaaactg aataagagga 300
agtgaatctt gaataatttt gtgttactca tagcgcgtaa ttttgtcta gggccgcggg 360
gactttgacc gtttacgtgg agactcgcgc aggtgttttt ctccaggtgtt ttccgcgttc 420
cggttcaaag ttggcgtttt attattatag tcagctgacg ttagtgttat ttataccgg 480
tgagttcctc aagaggccac tcttgagtgc cagcgagtag agttttctcc tccgagccgc 540
tccgacaccg ggactgaaaa tgagacatga ggtactggct gataatcttc cacctcctag 600
ccattttgaa ccacctaccc ttcacgaact gtatgattta gacgtgacgg ccccggaaga 660
tcccaacgag gaggcggttt cgcagatttt tcccgaactc gtaatgttgg cgggtgcagga 720
agggattgac ttactcactt ttccgcgcgc gcccggttct ccggagccgc ctccactttc 780
ccggcagccc gagcagccgg agcagagagc cttgggtccg gtttgccacg aggtgtgctt 840
tccaccaggt gacgacgagg atgaagaggg tgaggagtgt gtgttagatt atgtggagca 900
ccccgggcac ggttgcaggt cttgtcatta tcaccggagg aatacggggg acccagatat 960
tatgtgttcg ctttgctata tgaggacctg tggcatgttt gtctacagta agtgaaaatt 1020
atgggcagtg ggtgatagag tgggtgggtt ggtgtggtaa tttttttttt aatttttaca 1080
gttttgtggt ttaaagaatt ttgtattgtg atttttttaa aaggtcctgt gtctgaacct 1140
gagcctgagc ccgagccaga accggagcct gcaagaccta cccgccgtcc taaaatggcg 1200
cctgctatcc tgagacgccc gacatcacct gtgtctagag aatgcaatag tagtacggat 1260
agctgtgact ccggtccttc taacacacct cctgagatac acccggtggt cccgctgtgc 1320
cccattaaac cagttgccgt gagagttggt gggcgctcgc aggtgtgga atgtatcgag 1380
gactttgcta acgagcctgg gcaacctttg gacttgagct gtaaacgccc caggccataa 1440
ggtgtaaaac tgtgattgag tgtgtggtta acgcctttgt ttgctgaatg agttgatgta 1500
agtttaataa aggggtgagat aatgtttaac ttgcatggcg tgttaaattg ggcggggcct 1560
aaagggtata taatgcgcgc tgggctaata ttggttacct ctgacctcat ggaggcctgt 1620
gagtgtttgg aagatttttc tgctgtgcgt aacttgctgg aacagagctc taacagtacc 1680
tcttggtttt ggaggtttct gtggggctca tccagggcaa agttagtctg cagaattaag 1740
gaggattaca agtgggaatt tgaagagctt ttgaaatcct gtggtgagct gtttgattct 1800
ttgaatctgg gtcaccaggc gcttttccaa gagaaggtca tcaagacttt ggatttttcc 1860
acaccggggc gcgctgcggc tgctgttgcg tttttgagtt ttataaaagg taaatggagc 1920
gaagaaaccc atctgagcgg ggggtacctg ctggattttc tggccatgca tctgtggaga 1980
gcggttgtga gacacaagaa tcgcctgcta ctgttgcctt ccgtccgccc ggcgataata 2040
ccgacggagg agcagcagca gcagcaggag gaagccaggc ggcggcgcca ggagcagagc 2100
ccatggaacc cgagagccgc cctggaccct cgggaatgaa tgttgtacag gtggctgaac 2160
tgtatccaga actgagacgc attttgacaa ttacagagga tgggcagggg ctaaaggggg 2220
taaagaggga gcggggggct tgtgaggcta cagaggaggc taggaatcta gcttttagct 2280
taatgaccag acaccgtcct gagtgtatta cttttcaaca gatcaaggat aattgcgcta 2340
atgagcttga tctgctggcg cagaagtatt ccatagagca gctgaccact tactggctgc 2400
agccagggga tgattttgag gaggtatata ggggtatagc aaagggtgca cttagggcag 2460
attgcaagta caagatcagc aaacttgtaa atatcaggaa ttgttgctac atttctggga 2520
acggggccga ggtggagata gatacggagg atagggtggc ctttagatgt agcatgataa 2580
atatgtggcc gggggtgctt ggcattggag ggtgtgttat tatgaatgta aggtttactg 2640
gccccaatth tagcgtacg gttttcctgg ccaataccaa ccttatccta cacggtgtaa 2700
gcttctatgg gtttaacaat acctgtgtgg aagcctggac cgatgtaagg gttcggggct 2760
gtgcctttta ctgctgctgg aaggggggtg tgtgtcgcgc caaaagcagg gcttcaatta 2820
agaaatgcct ctttgaaagg tgtaccttgg gtatcctgtc tgagggtaac tccagggtgc 2880
gccacaatgt ggctccgac tgtggttgcg tcatgctagt gaaaagcgtg gctgtgatta 2940
agcataacat ggtatgtggc aactgcgagg acagggcctc tcagatgctg acctgctcgg 3000
acggcaactg tcacctgtg aagaccattc acgtagccag ccactctcgc aaggcctggc 3060
cagtgtttga gcataacata ctgaccgct gttccttgca tttgggtaac aggagggggg 3120
tgttcttacc ttaccaatgc aatttgatgc acactaagat attgcttgag cccgagagca 3180
tgtccaaggt gaacctgaac ggggtgtttg acatgacctt gaagatctgg aagggtgcta 3240
ggtacgatga gacccgcacc aggtgcagac cctgcgagtg tggcggtaaa catattagga 3300
accagcctgt gatgctggat gtgaccgagg agctgaggcc cgatcacttg gtgctggcct 3360
gcaccgcgcg tgagtttggc tctagcgatg aagatacaga ttgaggtact gaaatgtgtg 3420
ggcgtggctt aagggtggga aagaatatat aagggtgggg tcttatgtag tttttagtct 3480
gttttgcagc agccgcgcgc gccatgagca ccaactcgtt tgatggaagc atgtgagct 3540
catatttgac aacgcgcgat ccccatggg ccgggggtcg tcagaatgtg atgggctcca 3600
gcattgatgg tcgcccgcgc ctgcccgcga actctactac cttgacctac gagaccgtgt 3660
ctggaacgcc gttggagact gcagcctccg ccgcgccttc agccgctgca gccaccgccc 3720
gcgggattgt gactgacttt gctttcctga gccgccttgc aagcagtgca gcttcccgct 3780
catccgcccg cgatgacaag ttgacggctc ttttggcaca attggattct ttgacccggg 3840
aacttaatgt cgtttctcag cagctgttgg atctgcgcca gcaggtttct gcctgaagg 3900
cttctcccc tcccaatgag gtttaaaaca taaataaaaa accagactct gtttggattt 3960

```



```

ggatcaagca agtgtcttgc tgtctttatt taggggtttt gcgcgcgcgc taggccccgg 4020
accagcggtc tcggtcgttg agggctcctgt gtattttttt caggacgttg taaaggtgac 4080
tctggatggt cagatacatg ggcataagcc cgtctctggg gtggaggtag caccactgca 4140
gagcttcatg ctgcgggggtg gtgtttaga tgatccagtc gtagcaggag cgctgggcgt 4200
gggtgcctaaa aatgtctttc agtagcaagc tgattgccag gggcaggccc ttggtgtaag 4260
tgtttacaaa gcggttaagc tgggatgggt gcatacgttg ggaatgaga tgcattcttg 4320
actgtatttt taggttggtc atgttccag ccataccctt ccggggattc atgttgtgca 4380
gaaccaccag cacagtgtat ccggtgcact tgggaaattt gtcattgtagc ttagaaggaa 4440
atgcgtggaa gaacttgag acgcccctgt gacctcaaag attttccatg cattcgtcca 4500
taatgatggc aatgggcccc cgggcggcgc cctgggcgaa gatatttctg ggatcactaa 4560
cgtcatagtt gtgttccagg atgagatcgt cataggccat ttttcaaaag cgcgggcgga 4620
gggtgccaga ctgcggtata atggttccat ccggcccagg ggcgtagtta cctcacaga 4680
tttgattttc ccacgctttg agttcagatg gggggatcat gtctacctgc gggcgcatga 4740
agaaaacggt ttccggggta ggggagatca gctgggaaga aagcaggttc ctgagcagct 4800
gcgacttacc gcagccgttg gcccgtaaa tcacacctat taccgggtgc aactgtagt 4860
taagagagct gcagctgccg tcatcctcga gcaggggggc cacttcgtta agcatgtccc 4920
tgactcgcat gttttccctg accaaatccg ccagaaggcg ctgcgcgcc agcgtatgca 4980
gttcttgcaa ggaagcaaag tttttcaacg gtttgagacc gtccgcgcta ggcatgcttt 5040
tgagcgtttg accaagcagt tccaggcgtt cccacagctc ggtcacctgc tctacggcat 5100
ctcgatccag catatctcct cgtttcgcgg gtggggcgcg ctttcgctgt acggcagtag 5160
tcggtgctcg tccagacggg ccagggtcat gtctttccac gggcgcaggg tctcgtcag 5220
cgtagtcttg gtcacggtga aggggtgcgc tccgggctgc gcgctggcca ggggtcgctt 5280
gaggctggtc ctgctgggtg tgaagcgctg ccggtcttcg cctgcgcgt cgggcaggt 5340
gcatttgacc atggtgtcat agtccagccc ctccgcggcg tggcccttgg cgcgcagctt 5400
gcccttgag gaggcgccgc acgaggggca gtgcagactt ttgagggcgt agagcttggg 5460
cgcgagaaat accgattccg gggagtaggc atccgcgcgc caggccccgc agacggtctc 5520
gcattccacg agccagggtga gctctggcgg ttcggggcca aaaaccagggt ttcccccatg 5580
cgttttgatg cgtttcttac ctctggtttc catgagccgg tgtccacgct cggtagcgaa 5640
aaggctgttc gtgtcccggt atacagactt gagaggcctg tctcgcagcg gtgttccgcg 5700
gtcctcctcg tatagaaact cggaccactc tgagacaaag gctcgcgtcc aggccagcac 5760
gaaggaggct aagtgggagg ggtagcggtc gttgtccact aggggttcca ctgcctccag 5820
gggtgtgaaga cacatgtcgc cctcttcggc atcaaggaa gtgattgggt ttagttagta 5880
ggccacgtga ccgggtgttc ctgaaggggg gctataaaa ggggtggggg cgcgttcgtc 5940
ctcactctct tccgcatcgc tgtctgcgag ggccagctgt tggggtgagt actccctctg 6000
aaaagcgggc atgacttctg cgctaagatt gtcagtttcc aaaaacgagg aggatttgat 6060
attcaccttg cccgcgggtga tgcctttgag ggtggccgca tccatctggt cagaaaagac 6120
aatctttttg ttgtcaagct tgggtgcaaa cgaccgtag agggcggttg acagcaactt 6180
ggcgatggag gcgagggttt ggtttttgtc gcgatcggcg cgctccttgg ccgcgatgtt 6240
tagctgcacg tattcgcgcg caacgcaccg ccattcgga aagacggtg tgcgctcgtc 6300
gggcaccagg tgcacgcgcc aaccgcggtt gtgcagggtg acaaggtaaa cgctggtggc 6360
tacctctccg cgtaggcgct cgttggtcca gcagagcgcg ccgccccttg cgcgacagaa 6420
tggcggtagg gggcttagct gcgtctcgtc cggggggtct gcgtccacgg taaagacccc 6480
gggcagcagg cgcgcgtcga agtagtctat cttgcacctt tgcaagtcta cgcgctctg 6540
ccatgcgcgg gcggcaagcg cgcgctcgta tgggttgagt gggggacccc atggcatggg 6600
gtgggtgagc gcggaggcgt acatgcgca aatgtcgtaa acgtagagg gctctctgag 6660
tattccaaga tatgtagggt agcatcttcc accgcggatg ctggcgcgca cgtaatcgta 6720
tagttcgtgc gagggagcga ggaggtcggg accgaggttg ctacggcgcg gctgctctgc 6780
tcggaagact atctgcctga agatggcatg tgagttggat gatattggtg gacgctggaa 6840
gacgttgaag ctggcgtctg tgagacctac cgctcacgc acgaaggagg cgtaggagtc 6900
gcgcagcttg ttgaccagct cggcggtgac ctgcacgtct agggcgagtg agtccagggt 6960
ttccttgatg atgtcatact tatcctgtcc cttttttttt cacagctcgc ggttagaggac 7020
aaactcttcg cgttctttcc agtactcttg gatcggaac ccgtcggcct ccgaacggta 7080
agagcctagc atgtagaact ggttgacggc ctggtaggcg cagcatccct tttctacggg 7140
tagcgcgatg gcctgcgcgg ccttccggag cgaggtgttg gtgagcgcaa aggtgtccct 7200
gaccatgact ttgaggtact ggtatttgaa gtcagtgtcg tcgcatccgc cctgctccca 7260
gagcaaaaag tccgtgcgct ttttgaacg cggatttggc agggcgaaag tgacatcggt 7320
gaagagtatc tttccgcgcg gaggcataaa gttgcgtgtg atgcggaagg gtcccggcac 7380
ctcggaagc ttgttaatta cctggggcgc gagcacgac tcgtcaaagc cgttgatgtt 7440
gtggccacaca atgtaaagtt ccaagaagcg cgggatgccc ttgatggaag gcaattttt 7500
aagttcctcg taggtgagct cttcagggga gctgagcccg tgctctgaaa gggcccagtc 7560
tgcaagatga gggttggaag cgacgaatga gctccacagg tcacgggcca ttagcatttg 7620
cagggtggtc cgaagggtcc taaactggcg acctatggcc attttttctg ggggtgatga 7680
gtagaaggta agcggtctt gttcccagcg gtcccaccca aggttcgcgg ctaggctcgt 7740
cgcggcagtc actagaggct catctccgcc gaacttcagt accagcatga agggcacgag 7800
ctgcttccca aaggccccca tccaagtata ggtctctaca tcgtagggtg caaagagacg 7860
ctcggtgcga ggatgcgagc cgatcgggaa gaactggatc tcccgcacac aattggagga 7920

```

gtggctattg	atgtggtgaa	agtagaagtc	cctgcgacgg	gccgaacact	cgtgctggct	7980
tttgaataaa	cgtgcgcagt	actggcagcg	gtgcacgggc	tgtacatcct	gcacgaggtt	8040
gacctgacga	ccgcgcacaa	ggaagcagag	tgggaatttg	agcccctcgc	ctggcgggtt	8100
tggctggtgg	tcttctactt	cggctgcttg	tccttgaccg	tctggctgct	cgaggggagt	8160
tacggtggtg	cggaccacca	cgcgcgcgca	gcccacagtc	cagatgtccg	cgcgcggcgg	8220
tcggagcttg	atgacaacat	cgcgcagatg	ggagctgtcc	atggctgga	gctcccgcgg	8280
cgtcagggtca	ggcgggagct	cctgcaggtt	tacctcgcat	agacgggtca	gggcgcgggc	8340
tagatccagg	tgatacctaa	ttccaggggg	ctggttggtg	gcggcgctcga	tggtctgcaa	8400
gaggccgcat	ccccgcggcg	cgactacggt	accgcgcggc	gggcgggtggg	ccgcgggggt	8460
gtccttggat	gatgcatcta	aaagcgggtg	cgcgggcgag	ccccgcggag	tagggggggc	8520
tcgggacccg	ccgggagagg	gggcaggggc	acgtcggcgc	cgcgcgcggg	caggagctgg	8580
tgtctgcgcg	gtaggttgct	ggcgaacgcg	acgacgcggc	ggttgatctc	ctgaatctgg	8640
cgcctctcgc	tgaagacgac	gggcccgggtg	agcttgagcc	tgaagagag	ttcgacagaa	8700
tcaatttcgg	tgctgttgac	ggcggcctgg	cgcaaaatct	cctgcacgtc	tcctgagttg	8760
tcttgatagg	cgatctcggc	catgaactgc	tcgatctctt	cctcctggag	atctcccggt	8820
ccggctcgct	ccacgggtggc	ggcgaggctg	ttggaaatgc	gggccatgag	ctgcgagaag	8880
gcgttgaggc	ctccctcggt	ccagacgcgg	ctgtagacca	cgcccccttc	ggcatcgcg	8940
gcgcgcatga	ccacctgcgc	gagattgagc	tccacgtgcc	gggcgaagac	ggcgtagttt	9000
cgcaggcgct	gaaagaggta	gttgagggtg	gtggcggtgt	gttctgccac	gaagaagtac	9060
ataaccagcg	gtcgcaacgt	ggattcgttg	atatccccc	aggcctcaag	gcgctccatg	9120
gcctcgtaga	agtccacggc	gaagttgaaa	aactgggagt	tgcgcgccga	cacggttaac	9180
tcctctctca	gaagacggat	gagctcggcg	acagtgctgc	gcacctcgcg	ctcaaaaggct	9240
acaggggcct	cttcttcttc	ttcaatctcc	tcttccataa	gggcctcccc	ttcttctct	9300
tctgcgcggc	gtgggggagg	ggggacacgg	cggcgacgac	ggcgacccgg	gaggcgctcg	9360
acaaagcgct	cgatcatctc	cccgcggcga	cggcgcatgg	tctcggtgac	ggcgcgcccg	9420
ttctcgcggg	ggcgaggttg	gaagacgcgg	cccgtcatgt	cccggttatg	ggttgccggg	9480
gggctgccat	gcggcaggga	tacggcgcta	acgatgcata	tcaacaattg	ttgtgtaggt	9540
actccgcgcg	cgagggaacct	gagcgagtcc	gcatacgacc	gatcggaaaa	cctctcgaga	9600
aaggcgctcta	accagtcaca	gtcgcaaggt	aggctgagca	ccgtggcggg	cggcagcggg	9660
cggcggtcgg	ggttggttct	ggcgaggtg	ctgctgatga	tgtaattaaa	gtaggcggtc	9720
ttgagacggc	ggatggtcga	cagaagcacc	atgtccttgg	gtccggcctg	ctgaatgcgc	9780
aggcggtcgg	ccatgcccca	gacttctgtt	tgacatcggc	gcaggctctt	gtagtgtct	9840
tgcatgagcc	tttctaccgg	cacttcttct	tctccttctt	cttgtctctg	atctcttgca	9900
tctatcgctg	cggcggcggc	ggagtttggt	cgtaggtggc	gccctcttcc	tcccatcgct	9960
gtgaccccca	agccccctcat	cggctgaagc	agggttaggt	cggcgacaac	gcgctcggtt	10020
aatatggcct	gctgcacctg	cgtgagggtg	gactggaagt	catccatgtc	cacaaagcgg	10080
tggtatgcgc	ccgtgttgat	ggtgtaagtg	cagtggcca	taacggacca	gttaacggtc	10140
tggtgacccg	gctgcgagag	ctcgggttac	ctgagacgcg	agtaagccct	cgagtcaaat	10200
acgtagtcgt	tgcaagtccg	caccaggtag	tggtagtcca	ccaaaaagtg	cggcggcggc	10260
tggcggtaga	ggggccagcg	taggggtggc	ggggctccgg	gggcgagatc	ttccaacata	10320
aggcgatgat	atccgtagat	gtacctggac	atccaggtga	tgccggcggc	ggtggtggag	10380
gcgcgcggaa	agtcgcggac	gcggttccag	atgttgcgca	gcggcaaaaa	gtgctccatg	10440
gtcgggacgc	tctggccggg	caggcgcgcg	caatcgttga	cgctctagcg	tgcaaaaagg	10500
gagcctgtaa	gcggggcactc	ttccgtgggt	tggtggataa	attcgcaagg	gtatcatggc	10560
ggagcagccg	gggttcgagcc	ccgtatccgg	ccgtccgcgg	tgatccatgc	ggttaccgcc	10620
cgcggtgcga	accaggtgtg	gcgacgtcag	acaacggggg	agtgtctcct	ttggcttctt	10680
tccaggcgcg	gcgggtgctg	cgtagctttt	tttgccact	ggccgcgcgc	agcgtaagcg	10740
gtagggtcgg	aaagcgaaa	cattaagtgg	ctcgctccct	gtagccggag	ggttatattt	10800
caagggttga	gtcgcgggac	ccccggttcg	agtctcggac	cggccggact	gcggcgaaac	10860
ggggtttgcc	tccccgtcat	gcaagacccc	gcttgcaaat	tcctccggaa	acagggacga	10920
gccccctttt	tgcttttccc	agatgcatcc	ggtgctgcgg	cagatgcgcc	ccccctctca	10980
gcagcgccaa	gagcaagagc	agcggcagac	atgcagggca	ccctcccctc	ctcctaccgc	11040
gtcaggaggg	gcgacatccg	cggttgacgc	ggcagcagat	ggtgattacg	aacccccgcg	11100
gcgccggggc	cggcactacc	tggacttgga	ggaggcgag	ggcctggcgc	ggctaggagc	11160
gccctctcct	gagcgggtacc	caagggtgca	gctgaagcgt	gatacgctg	aggcgtacgt	11220
gccgcggcag	aacctgtttc	gcgaccgcga	gggagaggag	cccagaggaga	tgccgggacg	11280
aaagtccacc	gcagggcgcg	agctgcggca	tggcctgaat	cgcgagcggt	tgctgcgcga	11340
ggaggacttt	gagcccgcag	cgcgaaccgg	gattagtccc	gcgcgcgcac	acgtggcgcg	11400
cgccgacctg	gtaaccgcat	acgagcagac	ggtgaaccag	gagattaact	ttcaaaaaag	11460
ctttaacaac	cacgtgcgta	cgcttggtgg	gcgcgaggag	gtggctatag	gactgatgca	11520
tctgtgggac	tttgtaagcg	cgctggagca	aaaccccaat	agcaagccgc	tcatggcgca	11580
gctgttcctt	atagtgcagc	acagcaggga	caacgaggga	ttcagggatg	cgctgctaaa	11640
catagttagg	cccaggggac	ctgtgctgct	cgatttgata	aacatcctgc	agacatagt	11700
ggtgcaggag	cgcagcttga	gcctggctga	caagggtggc	gccatcaact	attccatgct	11760
tagcctgggc	aagttttacg	cccgcagat	ataccatacc	ccttacgttc	ccatagacaa	11820
ggaggtaaa	atcgaggggt	tctacatg	catggcgctg	aagggtgctta	ccttgagcga	11880

cgacctgggc gtttatcgca acgagcgcat ccacaaggcc gtgagcgtga gccggcgcg 11940
 cgagctcagc gaccgcgagc tgatgcacag cctgcaaaagg gccctggctg gcacggggcag 12000
 cgggcagatga gagggccgagt cctactttga cggggcgct gacctgcgct ggcccccaa 12060
 ccgacgcgccc ctggaggcag ctggggcccg acctgggctg gcggtggcac ccgcgcgcg 12120
 tggaacgctc ggccggcgtg aggaatatga caggagcagc gactacgagc cagaggacgc 12180
 cgagtactaa gcggtgatgt ttctgatcag atgatgcaag acgcaacgga cccggcggtg 12240
 cggggcgcgcc tgcagagcca gccgtccggc cttactcca cggacgactg gcgccaggtc 12300
 atggaccgca tcatgtcgct gactgcgcgc aatcctgacg cgttccggca gcagccgagc 12360
 gccaaaccggc tctccgcaat tctggaagcg gtggtcccg cgcgcgcaaa cccacgcac 12420
 gagaaggtgc tggcgatcgt aaacgcgctg gccgaaaaca ggccatccg gcccgacgag 12480
 gccggcctgg tctacgacgc gctgcttcag cgcgtggctc gttacaacag cggcaacgtg 12540
 cagaccaacc tggaccggct ggtgggggat gtgcgcgagg ccgtggcgca cgtgagcgc 12600
 gcgcagcagc agggcaacct gggctccatg gttgcactaa acgccttctt gactacacag 12660
 cccgccaaacg tgcgcggggg acaggaggac tacaccaact ttgtgagcg actgcggtc 12720
 atggtgactg agacaccgca aagtggaggtg taccagtctg ggccagacta tttttccag 12780
 accagttagc aaggcctgca gaccgtaaac ctgagccagg ctttcaaaaa cttgcagggg 12840
 ctgtgggggg tgcgggctcc cacaggcgac cgcgcgacgc tgtctagctt gctgacgcgc 12900
 aactcgcgcc tgttgcgtct gctaatacgc cccttcacgg acagtggcag cgtgtcccg 12960
 gacacatacc taggtcactt gctgacactg taccgcgagg ccataggtca ggcgcatgtg 13020
 gacgagcata ctttccagga gattacaagt gtcagcccg cgtggggca ggaggacagc 13080
 ggcagcctgg aggcaacct aaactacct ctgaccaacc ggcggcagaa gatccccctg 13140
 ttgcacagtt taaacagcga ggaggagcgc attttgcgt acgtgcagca gacggtgagc 13200
 cttaacctga tgcgcgacgg gtaaacgccc agcgtggcg tggacatgac cgcgcgcaac 13260
 atggaaccgg gcatgtatgc ctcaaacgg cgtttatca accgccta at ggactacttg 13320
 catcgcgcgg ccgcccgtgaa ccccgagtat ttaccaatg ccatcttga cccgcactgg 13380
 ctaccgcccc ctggtttcta caccggggga ttcgaggtgc ccgagggtaa cgtgagttc 13440
 ctctgggacg acatagacga cagcgtgttt tccccgaac cgcagaccct gctagagttg 13500
 caacagcgcg agcaggcaga ggcggcgctg cgaaggaaa gcttccgag gccaaagcagc 13560
 ttgtccgacg taggcgctgc ggcgccgccc tcagatgcta gtagccatt tccaagctt 13620
 ataggtcttc ttaccagcac tcgcaccacc cgcgcgcgcc tgcggggcga ggaggaggt 13680
 ctaaaacaact cgctgctgca gccgcagcgc gaaaaaaacc tgcctccggc atttcccaac 13740
 aacgggatag agagcctagt ggacaagatg agtagatgga agacgtacgc gcaggagcac 13800
 agggacgtgc caggcccgcg cccgcccacc cgtcgtcaaa ggcacgaccg tcagcgggg 13860
 ctggtgtggg aggacgatga ctggcagac gacagcagcg tctggattt ggaggaggt 13920
 ggcaaccctg ttgcgacact tcgccccagg ctggggagaa tgttttaaaa aaaaaaaagc 13980
 atgatgcaaa aaaaaaact caccaaggcc atggcaccga gcgttggtt tctgtattc 14040
 cccttagtat gcggcgcgcg gcgatgtatg aggaaggtcc tcctccctcc tacgagagt 14100
 tggtagcgcg ggcgccagt ggcgcgcgc tgggttctcc ctctgatgct cccctggacc 14160
 cgccgtttgt gcctcccgcg tacctgcgccc ctaccggggg gagaaacagc atccgttact 14220
 ctgagttggc acccctattc gacaccacc gtgtgtacct ggtggacaac aagtcaacg 14280
 atgtggcatc cctgaactac cagaacgacc acagcaact tctgaccag gtcatcaaa 14340
 acaatgacta cagcccgggg gaggcaagca cacagaccat caatcttgac gaccggtcgc 14400
 actggggcgg cgacctgaaa acctcctgc ataccaatg gccaaatgtg aacgagttca 14460
 tgtttaccaa taagttaag gcgcgggtga tgggtgcgcg cttgctact aaggacaatc 14520
 aggtgagact gaaatacgag tgggtgagat tcacgctgcc cgagggcaac tactccgaga 14580
 ccatgaccat agaccttatg aacaacgca tcgtggagca ctacttgaaa gtgggcagac 14640
 agaacgggg tctgaaaagc gacatcgggg taaagtttga caccgcaac ttcagactg 14700
 ggtttgacct cgctactggt cttgtcatgc ctggggtata taaaaacgaa gccttccatc 14760
 cagacatcat tttgctgcca ggatgcgggg tggacttcac ccacagccgc ctgagcaact 14820
 tgttgggcat ccgcaagcgg caacccttcc aggagggtt taggatcacc tacgatgatc 14880
 tggagggtgg taacattccc gcactgttg atgtggacgc ctaccaggcg agcttgaaag 14940
 atgacaccga acagggcggg ggtggcgag gcgcgagcaa cagcagtggc agcggcgcg 15000
 aagagaactc caacgcggca gccgcggcaa tgcagccggt ggaggacatg aacgatcatg 15060
 ccattcgcg cgacacctt gccacacggg ctgaggagaa gcgcgctgag gccgaagcag 15120
 cggccgaagc tgcgcgcccc gctgcgcaac ccgaggtcga gaagcctcag aagaaaccgg 15180
 tgatcaaaacc cctgacagag gacagcaaga aacgcagtta caacctata agcaatgaca 15240
 gcaccttcac ccagtaccgc agctgttacc ttgcatacaa ctacggcgac cctcagaccg 15300
 gaatccgctc atggaccctg ctttgactc ctgacgtaac ctgcggtctg gagcaggtct 15360
 actggtcgtt gccagacatg atgcaagacc ccgtgacctt ccgctccag cgcagatca 15420
 gcaactttcc ggtggtgggg gccgagctgt tccccgtgca ctccaagagc ttctacaacg 15480
 accaggccgt ctactcccaa ctcacccgccc agtttacctc tctgaccac gtgttcaatc 15540
 gctttcccg gaaccagatt ttggcgccc cgcagcccc caccatcacc accgtcagtg 15600
 aaaacgttcc tgctctcaca gatcacggga cgtaccgct gcgcaacagc atcggaggag 15660
 tccagcgagt gaccattact gacgcagac gccgcacct cccctacgtt tacaaggccc 15720
 tgggcatagt ctgcgcgcgc gtcctatcga gccgcacttt ttgagcaagc atgtccatcc 15780
 ttatatcgcc cagcaataac acaggctggg gcctgcgctt cccaagcaag atgtttggcg 15840

```

ggggcgaagaa ggcgtccgac caacacccag tgcgcgtgcg cgggcactac cgcgcgccct 15900
ggggcgcgca caaacgcggc cgcactgggc gcaccaccgt cgtgacgcc atcgacgcgg 15960
tggtggagga ggcgcgaac tacacgcca cgccgccacc agtgccaca gtggacgcgg 16020
ccattcagac cgtggtgcmc ggagcccgcc gctatgctaa aatgaagaga cggcgaggc 16080
gcgtagcacg tcgccaccgc cgcgcaccgc gcaactgccg ccaacgcgcg cggcgccc 16140
tgcttaaccg cgcacgtcmc accggccgac gggcgcccat gcggggcgct cgaaggctgg 16200
ccgggggtat tgcactgtg ccccccaggt ccaggcgacg agcgcccgcc gcagcagccg 16260
cggccattag tgctatgact cagggtcgca ggggcaacgt gtattgggtg cgcgactcgg 16320
ttagcgccct gcgcgtgccc gtgcgcacc gcccccgcg caactagatt gcaagaaaaa 16380
actacttaga ctcgactgt tgcgtatc cagcgccggc ggcgcgcaac gaagctatgt 16440
ccaagcgcaa aatcaagaa gagatgctcc aggtcatcgc gccggagatc tatggccccc 16500
cgaagaagga agagcaggt tacaagccc gaaagctaaa gcgggtcaaa aagaaaaaga 16560
aagatgatga tgatgaactt gacgacgagg tggaactgct gcacgctacc gcgcccaggc 16620
gacgggtaca gtggaaggt cgacgcgtaa aacgtgtttt gcgacccggc accaccgtgg 16680
tctttacgcc cggtgagcmc tccaccgca cctacaagcg cgtgtatgat gagggtgtacg 16740
gcgacgagga cctgcttgag caggccaacg agcgccctcg ggagtttgcc tacggaaaagc 16800
ggcataagga catgctggcg ttgcccgtgg acgagggcaa cccaacacct agcctaagc 16860
ccgtaacact gcagcaggtg ctgcccgcgc ttgcaccgtc cgaagaaaag cgcggccctaa 16920
agcgcgatgc tggtgacttg gcacccaccg tgcagctgat ggtacccaag cgcagcgac 16980
tggaagatgt cttgaaaaa atgaccgtgg aacctgggct ggagcccgag gtccgcgtgc 17040
ggccaatcaa gcaggtggcg ccgggactgg cgtgacgac cgtggacgtt cagataccca 17100
ctaccagtag caccagtatt gccaccgcca cagaggcat ggagacaaa acgtccccgc 17160
ttgctcagc ggtggcggtg cgcgcgtgac agcggtgcmc tgcggccgcg tccaagacct 17220
ctacggaggt gcaaacggac ccgtggatgt ttgcgctttc agcccccgcg cgcgcgcgcg 17280
gttcgagga gtacggcgcc gccagcgcmc tactgcccga atatgcccta catcctcca 17340
ttgcgcctac ccccggctat cgtggctaca cctaccgccc cagaagacga gcaactaccc 17400
gacgcgaac caccactgga acccgccgcg gccgtgcmc tcgacgccc gtgctggccc 17460
cgatttcctc gcgacgggtg gctcgcaag gaggcagcac cctgggtgctg ccaacagcgc 17520
gctaccacc cagcatcgtt taaaagccgg tctttgtggt tcttgagat atggccctca 17580
cctgcccct ccgtttcccg gtgcccggat tccgaggaag aatgcacctg aggaggggca 17640
tggccggcca cggcctgacg ggcggcatgc gtcgtgcmc ccaccggcg cggcgcgctg 17700
cgacacgtcg catgcgcg cgtatcctgc cctccttat tccactgatc gccgcgcgca 17760
ttggcgccgt gcccggaatt gcatccgtgg ccttgaggc gcagagacac tgattaaaaa 17820
caagtggcat gtgaaaaat caaaataaaa agtctggact ctacgctcg cttggtcctg 17880
taactatttt gtagaatgga agacatcaac tttgcgtctc tggcccccg acacggctcg 17940
cgccggttca tgggaaactg gcaagatata ggcaccagca atatgagcgg tggcgcttc 18000
agctggggct cgctgtggag cggcattaaa aatttcggtt ccaccgttaa gaactatggc 18060
agcaaggcct ggaacagcag cacaggccag atgctgagg ataagttgaa agagcaaat 18120
ttccaacaaa aggtggtaga tggcctggcc tctggcatta gcgggggtgg ggacctggcc 18180
aaccaggcag tgcaaaataa gattaacagt aagcttgatc ccgcccctcc cgtagaggag 18240
cctccaccgg ccgtggagac agtgctcca gaggggcggt gcgaaaagcg tccgcgccc 18300
gacagggaag aaactctggt gacgcaata gacgagcct cctcgtaga ggaggcacta 18360
aagcaaggcc tgcccaccac ccgtcccatc gcgcccagtg ctaccgaggt gctggggcag 18420
cacacaccgg taacgtgga cctgctccc ccgcccga cccagcagaa acctgtgctg 18480
ccaggcccga ccgcccgtgt tgtaaccgct cctagccg cgtccctg cgcgcgcgcc 18540
agcggtccgc gatcgttgcg gcccgtagcc agtggcaact ggcaagcac actgaacagc 18600
atcgtgggtc tgggggtgca atcccgaag cgccgacgat gcttctgaat agctaactg 18660
tcgtatgtgt gtcattgat cgtccatgt gccgcccag gagctgtga gccgcgcgc 18720
gcccgtttc caagatggct acccctcga tgatgccgca tgggtcttac atgcacatc 18780
cgggccagga cgcctcgag tacctgagcc ccgggctggt gcagtttgcc cgcgccaccg 18840
agacgtactt cagcctgaat aacaagtta gaaacccac ggtggcgcc acgcacgacg 18900
tgaccacaga ccggtcccag cgtttgacgc tgcggttcat ccctgtggac cgtgaggata 18960
ctgcgtactc gtacaaggcg cggttcacc tagctgtgg tgataaccgt gtgctggaca 19020
tggcttccac gtactttgac atccgcggc tgctggacag gggccctact ttaagccct 19080
actctggcac tgctacaac gccctggct ccaagggtgc cccaaatcct tgcgaatggg 19140
atgaagctgc tactgctctt gaaataaac tagaagaaga ggacgatgac aacgaagacg 19200
aagttagcga gcaagctgag cagcaaaaaa ctcacgtatt tgggcaggcg ccttattctg 19260
gtataaatat taaaaaggag ggtattcaaa taggtgtcga aggtcaaa cctaataatg 19320
ccgataaaac atttcaacct gaacctcaaa taggagaatc tcagtgttac gaaactgaaa 19380
ttaatcatgc agctgggaga gtccttaaaa agactacccc aatgaaacca tgttacggtt 19440
catatgcaaa acccaaaaat gaaaaatggg ggcaaggcat tcttgtaaa gcaaaaaatg 19500
gaaagctaga aagcaagtg gaaatgcaat tttctcaac tactgaggc accgaggca 19560
atggtgataa cttgactcct aaagtggat tgtacagtga agatgtagat atagaacccc 19620
cagacactca tatttcttac atgcccacta ttaaggagg taactcacga gaactaatgg 19680
gccaacaatc tatgcccac aggcctaatt acattgctt tagggacaat ttatttggtc 19740
taatgtatta caacagcac ggtaatatgg gtgttctggc gggccaagca tcgcagttga 19800

```

```

atgctgttgt agatttgcaa gacagaaaca cagagctttc ataccagctt ttgcttgatt 19860
ccattgggtga tagaaccagg tacttttcta tgtggaatca ggctgttgac agctatgata 19920
cagatgttag aattattgaa aatcatggaa ctgaagatga acttccaaat tactgctttc 19980
cactgggagg tgtgattaat acagagactc ttaccaaggt aaaacctaaa acagggtcagg 20040
aaaatggatg ggaanaagat gctacagaat ttccagataa aaatgaaata agagttggaa 20100
ataattttgc catggaaatc aatctaaatg ccaacctgtg gagaaatttc ctgtactcca 20160
acatagcgct gtatttgccc gacaagctaa agtacagtcc ttccaacgta aaaatttctg 20220
ataacccaaa cactacgac tacatgaaca agcgagtgtt ggctcccggg ttagtggact 20280
gctacattaa ccttgagca cgctggtccc ttgactatat ggacaacgtc aacccattta 20340
accaccaccg caatgctggc ctgcgtacc gctcaatgtt gctgggcaat ggtcgctatg 20400
tgcccttcca catccagggt cctcagaagt tctttgcat taaaaacctc cttctcctg 20460
cgggctcata cactacgag tggacttca ggaaggatgt taacatggtt ctgcagagct 20520
ccctaggaaa tgacctagg gttagcggag ccagcattaa gtttgatagc atttgccttt 20580
acgccacctt ctccccatg gccacaaca ccgcctccac gcttgaggcc atgtctagaa 20640
acgacaccaa cgaccagtcc tttaacgact atctctccgc cgccaacatg ctctacccta 20700
taccgcctaa cgctaccaac gtgcccata ccatcccctc ccgcaactgg gcggctttcc 20760
gcggctgggc cttcacgcgc ctttaagacta aggaaccccc atcactgggc tcgggctacg 20820
acccttatta cactactct ggctctata cctacctaga tggaaacctt tacctcaacc 20880
acacctttaa gaagggtggc attacctttg actcttctgt cagctggcct ggcaatgacc 20940
gcctgcttac ccccaacgag ttgaaatta agcgctcagt tgacggggag ggttacaacg 21000
ttgcccagtg taacatgacc aaagactggt tcctggtaca aatgctagct aactacaaca 21060
ttggctacca gggcttctat atcccagaga gctacaagga ccgcatgtac tccttcttta 21120
gaaacttcca gcccatgagc cgtcagggtg tggatgatac taaatacaag gactaccaac 21180
aggtgggcat cctacaccaa cacaacaact ctggatttgt tggctacctt gcccccacca 21240
tgcgcgagg acaggcctac cctgctaact tcccctatcc gcttataggc aagaccgcag 21300
ttgacagcat taccagaaa aagtttcttt gcgatcgac cctttggcgc atccccattc 21360
ccagtaacct tatgtccatg ggcgactca cagacctggg ccaaaacctt ctctacgcca 21420
actccgcccc cgcgctagac atgacttttg aggtggatcc catggacgag ccacaccttc 21480
tttatgtttt gtttgaagtc tttagctgg tccgtgtgca ccggccgcac gcggcgctca 21540
tcgaaaccgt gtacctgcgc acgcccctct cgcccgcaa cgccacaaca taaagaagca 21600
agcaacatca acaacagctg ccgcatggg ctccagtgag caggaactga aagccattgt 21660
caaagattct ggttgtggc catatttttt gggcacctat gacaagcgct ttccaggctt 21720
tgtttctcca cacaagctcg cctgcgccat agtcaatacg gccggtcgcg agactggggg 21780
cgtacactgg atggcctttg cctggaaccc gcaactcaaa acatgctacc tctttgagcc 21840
ctttggcttt tctgaccagc gactcaagca ggtttaccag tttgagtacg agtcaactct 21900
gcgcgtagc gccattgctt cttccccga ccgctgtata acgctggaaa agtcccacca 21960
aagcgtacag gggcccaact cggccgcctg tggactatcc tctgcatgtt ttctccacgc 22020
ctttgccaac tggcccaaaa ctcccatgga tcacaacccc accatgaacc ttattaccgg 22080
ggtaccacac tccatgtcca acagtcccca ggtacagccc accctgcgtc gcaaccagga 22140
acagctctac agcttccctg agcgccactc gccctacttc cgcagccaca gtgcgagat 22200
taggagcgcc acttcttttt gtcacttgaa aaacatgtaa aaataatgta ctagagacac 22260
tttcaataaa ggcaaatgct tttatttgta cactctcggg tgattattta cccccacct 22320
tgccgtctgc gccgtttaa aatcaaaagg gttctgccc gcacgctat gcgccactgg 22380
cagggacacg ttgcgatact ggtgtttagt gctccactta aactcaggca caaccatccg 22440
cggcagctcg gtgaagtgtt cactccacag gctgcgcacc atcaccacg cgtttagcag 22500
gtcgggcgcc gatatttga agtcgcagtt ggggcctccg ccctgcgcgc gcgagttgcg 22560
atacacaggg ttgcagcact ggaacactat cagcgccggg tgggtgcacg tcggccagc 22620
gctcttgtcg gagatcagat ccgcgtccag gtcctccgcg ttgctcaggg cgaacggagt 22680
caactttggt agctgccttc ccaaaaaggg cgcggtgcca ggctttgagt tgcaactgca 22740
ccgtagtggc atcaaaaagg gaccgtgccc ggtctgggcg ttaggataca gcgcctgcat 22800
aaaagccttg atctgcttaa aagccacctg agcctttgcg ccttcagaga agaacatgcc 22860
gcaagacttg ccggaanaact gattggcggg acaggccggg tcgtgcacgc agcaccttgc 22920
gtcgggtgtg gagatctgca ccacatttcg gccccaccgg ttcttcacga tcttgccct 22980
gctagactgc tccttcagcg cgcgctgccc gttttcgctc gtcacatcca tttcaatcac 23040
gtgctcctta tttatcataa tgcttccgtg tagacactta agctcgctt cgatctcagc 23100
gcagcggtgc agccacaacg cgcagcccgt gggctcgtga tgctttagg tcacctctgc 23160
aaacgactgc aggtacgcct gcaggaatcg ccccatcatc gtcacaaagg tcttgttgc 23220
ggtgaaggtc agctgcaacc cgcggtgctc ctcggtcagc caggtcttgc atacggccg 23280
cagagcttcc acttggctcag gcagtagttt gaagttcgcc tttagatcgt tatccacgtg 23340
gtacttgtcc atcagcgcg cgcgagcctc catgcccttc tcccacgcag acacgatcgg 23400
cacactcagc gggttcatca ccgtaatttc actttccgct tcgctgggct ctctctcttc 23460
ctcttgcgct cgcataccac gcgccactgg gtcgtcttca ttcagccgce gcactgtgcg 23520
cttactctct ttgccatgct tgaattgcac cggtggggtg ctgaaaccca ccattttag 23580
cgccacatct tctctttctt cctcgctgtc cagattacc tctggtgatg gcggggcgctc 23640
gggcttggga gaaggcgct tcttttctt cttggcgca atggccaaat ccgccgcga 23700
ggtcgatggc cgggggctg gtgtgcgcg caccagcgcg tcttgtgatg agtcttctc 23760

```

gtcctcggac	tcgatacgcc	gcctcatccg	cttttttggg	ggcgcccg	gaggcgcg	23820
cgacggggg	ggggacgaca	cgctcctccat	ggttggggga	cgctcgccg	caccgcgtcc	23880
gcgctcggg	gtggttctgc	gctgtcctc	ttcccgaactg	gccatttcc	tctcctatag	23940
gcagaaaaa	atcatggagt	cagtcgagaa	gaaggacagc	ctaaccgccc	cctctgagtt	24000
cgccaccacc	gcctccaccg	atgccgccaa	cgcgccctacc	accttccccg	tcgaggcacc	24060
cccgttgag	gaggaggaag	tgattatcga	gcaggaccca	ggttttgtaa	gcgaagacga	24120
cgaggaccgc	tcagtaccaa	cagaggataa	aaagcaagac	caggacaacg	cagaggcaaa	24180
cgaggaaaca	gtcggcggg	gggacgaaag	gcatggcgac	tacctagatg	tgggagacga	24240
cgtgtgttg	aagcatctgc	agcgccagtg	cgccattatc	tgcgacgcgt	tgcaagagcg	24300
cagcgatgtg	ccccctcgcca	tagcggatgt	cagccttgcc	tacgaacgcc	acctattctc	24360
accgcgcgta	ccccccaaac	gccaagaaaa	cggcacatgc	gagcccaacc	cgcgccctcaa	24420
cttctacccc	gtatttgccg	tgccagaggt	gcttgccacc	tatcacatct	ttttccaaaa	24480
ctgcaagata	cccctatcct	gccgtgccaa	ccgcagccga	gcggacaagc	agctggcctt	24540
gcgaggggc	gctgtcatac	ctgatatcgc	ctcgctcaac	gaagtgcgaa	aaatctttga	24600
gggtcttgga	cgcgacgaga	agcgcgcggc	aaacgctctg	caacaggaaa	acagcgaaaa	24660
tgaaagtcaa	tctggagtgt	tggtggaact	cgagggtgac	aacgcgcgcc	tagccgtact	24720
aaaacgcagc	atcgaggtca	cccactttgc	ctacccggca	cttaacctac	cccccaaggt	24780
catgagcaca	gtcatgagtg	agctgatcgt	gcgcgtgctg	cagccctg	agagggatgc	24840
aaatttgcaa	gaacaaacag	aggagggcct	acccgcagtt	ggcgacgagc	agctagcgcg	24900
ctggcttcaa	acgcgcgagc	ctgcccgaact	ggaggagcga	cgcaactaa	tgatggccg	24960
agtctcgtt	accgtggagc	ttgagtgcac	gcagcggttc	tttgctgacc	cggagatgca	25020
gcgcaagcta	gaggaaacat	tgactacac	ctttcgacag	ggctacgtac	gccaggcctg	25080
caagatctcc	aacgtggagc	tctgcaacct	ggtctcctac	cttggaattt	tgacgaaaaa	25140
ccgccttggg	aaaaacgtgc	ttcattccac	gctcaagggc	gaggcgcgcc	gcgactacgt	25200
ccgcgactgc	gtttacttat	ttctatgcta	cacctggcag	acggccatgg	gcgtttggca	25260
gcagtgttg	gaggagtga	acctcaagga	gctgcagaaa	ctgctaaagc	aaaacttgaa	25320
ggacctatgg	acggccttca	acgagcgctc	cgtagccgcg	cacctggcgg	acatcatttt	25380
ccccgaacgc	ctgcttaaaa	ccctgcaaca	gggtctgcca	gacttcacca	gtcaaaagcat	25440
gttgcaagac	tttaggaact	ttatcctaga	gcgctcagga	atcttgccc	ccacctgctg	25500
tgacttctc	agcgactttg	tgcccattaa	gtaccgcgaa	tgccctccgc	cgctttgggg	25560
ccactgctac	cttctgcagc	tagccaacta	ccttgccctac	cactctgaca	taatggaaga	25620
cgtgagcgg	gacggtctac	tggagtgtca	ctgtcgctgc	aacctatgca	ccccgcaccg	25680
ctccctgggt	tgcaattcgc	agctgcttaa	cgaaagtcaa	attatcggtg	cctttgagct	25740
gcaggggtccc	tcgctgacg	aaaagtccgc	ggctccgggg	ttgaaactca	ctccggggct	25800
gtggacgtcg	gcttaccttc	gcaaatttgt	acctgaggac	taccacgccc	acgagattag	25860
gttctacgaa	gaccaatccc	gcccgcgcaa	tgcgagagct	accgcctg	tcattaccca	25920
gggccacatt	cttggccaat	tgcaagccat	caacaaagcc	cgccaagagt	ttctgtctacg	25980
aaagggacgg	ggggtttact	tggaacccca	gtccggcgag	gagctcaacc	caatcccccc	26040
gccgcgcgag	ccctatcagc	agcagccgcg	ggcccttgct	tcccaggatg	gcacccaaaa	26100
agaagctgca	gctgccgcg	ccacccacg	acgaggagga	atactgggac	agtcaggcag	26160
aggaggttt	ggacgaggag	gaggaggaca	tgatggaaga	ctgggagagc	ctagacgagg	26220
aagcttccga	ggtcgaaag	gtgtcagacg	aaacaccgtc	accctcggtc	gcattcccc	26280
cgccggcgcc	ccagaaatcg	gcaaccggtt	ccagcatggc	tacaacctcc	gctcctcagg	26340
cgccgcgcg	actgcccg	cgccgaccca	accgtagatg	ggacaccact	ggaaccagg	26400
ccggtaaatc	caagcagccg	ccgcggttag	cccaagagca	acaacagcgc	caaggtacc	26460
gctcatggcg	cgggcacaag	aacgccatag	ttgcttgctt	gcaagactgt	gggggcaaca	26520
tctccttcgc	ccgcgcgtt	cttctctacc	atcacggcgt	ggccttcccc	cgtaaacatcc	26580
tgcatctact	ccgtcatctc	tacagcccat	actgcaccg	cggcagcggc	agcggcagca	26640
acagcagcgg	ccacacagaa	gcaaaggcga	ccgtagatga	agactctgac	aaagcccaag	26700
aaatccacag	cgcggcgagc	agcaggagga	ggagcgctgc	gtctggcgcc	caacgaaccc	26760
gtatcgaccc	gcgagcttag	aaacaggatt	tttcccaact	tgtagctat	atttcaacag	26820
agcagggggc	aagaacaaga	gctgaaaata	aaaaacaggt	ctctgcgac	cctcacccgc	26880
agctgcctgt	atcacaaaag	cgaagatcag	cttcggcgca	cgctggaaga	cgcgagggct	26940
ctcttcagta	aatactg	gctgactctt	aaggactagt	ttcgcgccct	ttctcaaatt	27000
taagtcgca	aactacgtca	tctccagcgc	ccacaccgcg	cgccagcacc	tgctcgtagc	27060
gccattatga	gcaaggaaat	tcccacgccc	tacatgtgga	gttaccagcc	acaaatggga	27120
cttgccgctg	gagctgccc	agactactca	acccgaataa	actacatgag	cgcgggaccc	27180
catatgat	ccgggtcaa	cggaaatccgc	gcccaccgaa	accgaattct	cttggaaacag	27240
cgggctatta	ccaccacacc	tcgtaataac	cttaatcccc	gtagttggcc	cgctgcctg	27300
gtgtaccagg	aaagtccgc	tcccaccact	gtggtacttc	ccagagacgc	ccaggcgcaa	27360
gttcagatga	ctaactcagg	ggcgagcgtt	gcggcgcgct	ttcgtcacag	ggtgcggtcg	27420
ccggggcagg	gtataactca	cctgacaatc	agagggcgag	gtattcagct	caacgacgag	27480
tcggtgagct	cctcgcttgg	tctccgtccg	gacgggacat	ttcagatcgg	cggcgcggcg	27540
cgctcctcat	tcacgcctcg	tcaggcaatc	ctaactctgc	agacctcgtc	ctctgagccg	27600
cgctctggag	gcattggaac	tctgcaattt	attgaggagt	ttgtgccatc	ggtctacttt	27660
aaccccttct	cgggacctcc	cggccactat	ccgtagcaat	ttattcctaa	ctttgacgcg	27720

gtaaaggact	cggcgagcgg	ctacgactga	atgttaagtg	gagaggcaga	gcaactgcgc	27780
ctgaaacacc	tgggtccactg	tcgcccacc	aagtgtttg	cccgcgactc	cggtgagttt	27840
tgctactttg	aattgcccg	ggatcatatc	gagggcccgg	cgacggcggt	ccggcttacc	27900
gcccaggagg	agcttgcccg	tagcctgatt	cgggagttaa	cccagcgccc	cctgctagtt	27960
gagcgggaca	ggggaccctg	tggtctcact	gtgatttgca	actgtcctaa	ccttgattta	28020
catcaagatc	ttgtttgcca	tctctgtgct	gagtataata	aatacagaaa	ttaaaatata	28080
ctggggctcc	tatcgccatc	ctgtaaaccg	caccgtcttc	acccgcccac	gcaaaccaag	28140
gcgaacctta	cctggtactt	ttaacatctc	tccctctgtg	atttacaaca	gtttcaaccc	28200
agacggagtg	agtctacgag	agaacctctc	cgagctcagc	tactccatca	gaaaaaacac	28260
cacctctctt	acctgcgggg	aacgtacgag	tgctgcaccg	gccgctgcac	cacacctacc	28320
gcctgaccgt	aaaccagact	ttttccggac	agacctcaat	aactctgttt	accagaacag	28380
gaggtgagct	tagaaaaccc	ttaggggtatt	aggccaaagg	cgagctact	gtgggggtta	28440
tgaacaattc	aagcaactct	acgggctatt	ctaattcagg	tttctctaga	agtcaggctt	28500
cctggatgct	agcatctgac	tttgccagc	acctgtccc	cgattttgtt	ccagctcaac	28560
tacagcgacc	caccctaaca	gagatgacca	acacaaccaa	cgcgcccgcc	gctaccggac	28620
ttacatctac	cacaaatata	ccccaaagtt	ctgcctttgt	caataactgg	gataacttgg	28680
gcatgtgggtg	gttctccata	gcgcttatgt	ttgtatgcct	tattattatg	tggctcatct	28740
gctgcctaaa	gcgcaaaccg	gcccgaaccac	ccatctatag	tcccatcatt	gtgtacaccc	28800
caaacaatga	tggaatccat	agattggagc	gactgaaaca	catgttcttt	tctcttacag	28860
tatgattaaa	tgagatctag	aaatggacgg	aattattaca	gagcagcgcc	tgctagaaa	28920
acgcagggca	gcggccgagc	aacagcgcat	gaatcaagag	ctccaagaca	tggttaactt	28980
gcaccagtg	aaaaggggta	tcttttgtct	ggtaaagcag	gccaaagtca	cctacgacag	29040
taataccacc	ggacaccgcc	ttagctacaa	gttgccaacc	aagcgctcaga	aatttgggtg	29100
catggtggga	gaaaagccca	ttaccataac	tcagcactcg	gtagaaaccg	aaggctgcat	29160
tcactcacct	tgtcaaggac	ctgaggatct	ctgcaccctt	attaagaccc	tgtgcggtct	29220
caaagatctt	attcccttta	actaataaaa	aaaaataata	aagcatcact	tacttaaaat	29280
cagttagcaa	atttctgtcc	agtttattca	gcagcacctc	cttgccctcc	tccagctct	29340
ggtattgcag	cttctcctcg	gctgcaaaact	ttctccacaa	tctaataatga	atgtcagttt	29400
cctcctgttc	ctgtccatcc	gcacccacta	tcttcattgt	gttgcatgat	aagcgcgcaa	29460
gaccgtctga	agataccttc	aaccccggtg	atccatata	cacggaaacc	ggtcctccaa	29520
ctgtgccttt	tcttactcct	ccctttgtat	cccccaatgg	gtttcaagag	agtcctccctg	29580
gggtactctc	tttgcgccta	tccgaacctc	tagttacctc	caatggcatg	cttgcgctca	29640
aaatgggcaa	cggcctctct	ctggacgagg	ccggcaacct	tacctcccaa	aatgtaacca	29700
ctgtgagccc	acctctcaaa	aaaaccaagt	caaacataaa	cctggaaata	tctgcacccc	29760
tcacagttac	ctcagaagcc	ctaactgtgg	ctgcgcgcgc	acctctaatt	gtcgcgggca	29820
acacactcac	catgcaatca	caggccccgc	taaccgtgca	cgactccaaa	cttagcattg	29880
ccacccaagg	acccctcaca	gtgtcagaag	gaaagctagc	cctgcaaaaca	tcaggcccc	29940
tcaccaccac	cgatagcagt	acccttacta	tcactgcctc	acccctctca	actactgcca	30000
ctggtagctt	gggcattgac	ttgaaagagc	ccattttata	acaaaatgga	aaactaggac	30060
taaagtacgg	ggctcctttg	catgtaacag	acgacctaaa	cactttgacc	gtagcaactg	30120
gtccaggtgt	gactattaat	aatacttcct	tgcaaaactaa	agttactgga	gccttggggtt	30180
ttgattcaca	aggcaatatg	caacttaatg	tagcaggagg	actaaggatt	gatttctcaa	30240
acagacgcct	tatacttgat	gttagttatc	cgtttgatgc	tcaaaaccaa	ctaaatctaa	30300
gactaggaca	gggcccctct	tttataaact	cagcccacaa	cttggatatt	aactacaaca	30360
aaggcccttta	cttggtttaca	gcttcaaaaca	attccaaaaa	gcttgagggt	aacctaaagca	30420
ctgccaaggg	gttgatgttt	gacgctacag	ccatagccat	taatgcagga	gatgggcttg	30480
aatttggttc	acctaatgca	ccaaacacaa	atccctctca	aacaaaaatt	ggccattggc	30540
tagaatttga	ttcaaaacaag	gctatgggtc	ctaaactagg	aactggcctt	agttttgaca	30600
gcacaggtgc	cattacagta	ggaacacaaa	ataatgataa	gctaactttg	tgaccacac	30660
cagctccatc	tcctaactgt	agactaaatg	cagagaaaaga	tgctaaactc	actttggtct	30720
taacaaaatg	tggcagtcac	atacttgcta	cagtttcagt	tttggtctgt	aaaggcagtt	30780
tggtccaat	atctggaaca	gttcaaagtg	ctcatcttat	tataagattt	gacgaaaatg	30840
gagtgtact	aaacaattcc	ttcctggacc	cagaatattg	gaactttaga	aatggagatc	30900
ttactgaagg	cacagcctat	acaaacgctg	ttggattttat	gcctaaccta	tcagcttatc	30960
caaaatctca	cggtaaaact	gccaaaagta	acattgtcag	tcaagtttac	ttaaaccggag	31020
acaaaactaa	acctgtaaca	ctaaccatta	cactaaacgg	tacacaggaa	acaggagaca	31080
caactccaag	tgcatactct	atgtcatttt	catgggactg	gtctggccac	aactacatta	31140
atgaaatatt	tgccacatcc	tcttacactt	tttcatacat	tgcccaagaa	taaagaatcg	31200
tttggtttat	gtttcaacgt	gtttatTTTT	caattgcaga	aaatttcaag	tcatttttca	31260
ttcagtagta	tagccccacc	accacatagc	ttatacagat	caccgtacct	taatacaact	31320
cacagaaccc	tagtattcaa	cctgccacct	ccctcccaac	acacagagta	cacagtcctt	31380
tctccccggc	tgcccttaaa	aagcatcata	tcattgggtaa	cagacataat	cttaggtgtt	31440
atattccaca	cggtttctctg	tcgagccaaa	cgctcatcag	tgatattaat	aaactccccg	31500
ggcagctcac	ttaagttcat	gtcgtgtgcc	agctgctgag	ccacaggctg	ctgtccaact	31560
tgcggttgct	taacgggcgg	cgaaggagaa	gtccacgcct	acatgggggt	agagtcataa	31620
tcgtgcatac	ggatagggcg	gtggtgctgc	agcagcgcg	gaataaactg	ctgccgcgcg	31680

```

cgctccgtcc tgcaggaata caacatggca gtggtctcct cagcgatgat tcgcaccgcc 31740
cgcagcataa ggcgccttgt cctccgggca cagcagcgca cctgatctc acttaaatca 31800
gcacagtaac tgcagcacag caccacaata ttgttcaaaa tcccacagtg caaggcgctg 31860
tatccaaagc tcatggcggg gaccacagaa cccacgtggc catcatacca caagcgcagg 31920
tagattaagt ggcgaccctt cataaacacg ctggacataa acattacctc ttttggcatg 31980
ttgtaattca ccacctcccg gtaccatata aacctctgat taaacatggc gccatccacc 32040
accatcctaa accagctggc caaaacctgc ccgccggcta tacactgcag ggaaccggga 32100
ctggaacaat gacagtggag agcccaggac tcgtaaccat ggatcatcat gctcgtcatg 32160
atatcaatgt tggcacaaca caggcacacg tgcatacact tcctcaggat tacaagctcc 32220
tcccgcgtta gaaccatata ccagggaaca acccattcct gaatcagcgt aaatcccaca 32280
ctgcaggga gacctcgac gtaactcacg ttgtgcattg tcaaagtgtt acattcgggc 32340
agcagcggat gatcctccag tatggtagcg cgggtttctg tctcaaaagg aggtagacga 32400
tccctactgt acggagtgcg ccgagacaac cgagatcgtg ttggtcgtag tgtcatgcca 32460
aatggaacgc cggacgtagt catatttctt gaagcaaaac cagggtgcggg cgtgacaaa 32520
agatctgctg ctccggcttc gccgcttaga tcgctctgtg tagtagttgt agtatatcca 32580
ctctctcaaa gcatccaggc gccccctggc ttccgggttct atgtaaaact cttcatgctc 32640
cgctgccctg ataacatcca ccaccgcaga ataagccaca cccagccaac ctacacattc 32700
gttctgcgag tcacacacgg gaggagcggg aagagctgga agaaccatgt tttttttttt 32760
attccaaaag attatccaaa acctcaaaat gaagatctat taagtgaacg cgctcccttc 32820
cgggtggcgtg gtcaaaactct acagccaaaag aacagataat ggcatattgta agatgttcca 32880
caatggcttc caaaaggcaa acggccctca cgtccaagtg gacgtaaaagg ctaaacctt 32940
cagggtgaat ctctcttata aacattccag cacttccaac catgccccaa taattctcat 33000
ctcgccacct tctcaatata tctctaagca aatcccgaat attaagtccg gccattgtaa 33060
aaatctgctc cagagcgccc tccaccttca gcctcaagca gcgaatcatg attgcaaaaa 33120
ttcaggttcc tcacagacct gtataagatt caaaagcggg acattaacaa aaataccgcg 33180
atcccgtagg tcccttcgca gggccagctg aacataatcg tgcaggtctg cacggaccag 33240
cgcgccact tcccgcgag gaaccttgac aaaagaaccc aactgatta tgacacgcat 33300
actcgagct atgctaacca gcgtagcccc gatgtaagct ttgttgcag ggcggcgata 33360
taaaatgcaa ggtgctgctc aaaaaatcag gcaaagcctc gcgcaaaaaa gaaagcacat 33420
cgtagtcatg ctcatgcaga taaaggcagg taagctccgg aaccaccaca gaaaaagaca 33480
ccatttttct ctcaaacatg tctgcgggtt tctgcataaa cacaaaaata aataacaaaa 33540
aaacatttaa acattagaag cctgtcttac aacaggaaaa acaaccctta taagcataag 33600
acggactacg gccatgccgg cgtgaccgta aaaaaactgg tcaccgtgat taaaaagcac 33660
caccgacagc tctcgggtca tgtccggagt cataatgtaa gactcggtaa acacatcagg 33720
ttgattcatc ggtcagtgct aaaaagcgac cgaatagacc cgggggaata cataccgcga 33780
ggcgtagaga caacattaca gccccatag gaggtataac aaaaattaata ggagagaaaa 33840
acacataaac acctgaaaaa cctcctgccc taggcaaaat agcaccctcc cgctccagaa 33900
caacatacag cgcttcacag cggcagccta acagtacgac ttaccagtaa aaaagaaaac 33960
ctattaaaaa aacaccactc gacacggcac cagctcaatc agtcacagt taaaaaggg 34020
ccaagtgcag agcgagtata tataggacta aaaaatgacg taacgggttaa agtccacaaa 34080
aaacaccag aaaaaccgcac gcgaacctac gcccagaaac gaaagccaaa aaaccacaa 34140
cttctcctaa tcgtcacttc cgttttccca cgttacgtaa cttccattt taagaaaaact 34200
acaattccca acacatacaa gttactccgc cctaaaacct acgtcaccgc ccccgttccc 34260
acgccccgcg ccacgtcaca aactccaccc cctcattatc atattggctt caatccaaaa 34320
taaggtatat tattgatgat g 34341

```

<210> 3

<211> 33699

<212> DNA

<213> Adenovirus subgroup C

<400> 3

```

catcatcaat aatatacctt attttgatt gaagccaata tgataatgag ggggtggagt 60
ttgtgacgtg gcgcggggcg tgggaacggg gcgggtgacg tagtagtgtg gcggaagtgt 120
gatgttgcaa gtgtggcgga acacatgtaa gcgacggatg tggcaaaagt gacgtttttg 180
gtgtgcgccc gtgtacacag gaagtacaaa ttttcgcgcg gttttaggcg gatgtttag 240
taaaatttgg cgtaaccgag taagatttgg ccattttcgc gggaaaactg aataagagga 300
agtgaatct gaataatttt gtgttactca tagcgcgtaa tatttgtcta gggcccgagg 360
gactttgacc gtttacgtgg agactcgccc agtggttttt ctcagggtgt tcccgcgttc 420
cgggtcaaaag ttggcgtttt attattatag tcagctgacg tgtagtgtat ttatacccg 480
tgagttctc aagaggccac tcttgagtgc cagcagtag agttttctcc tccgagccgc 540
tccgacaccg ggaactgaaa tgagacatat tatctgccac ggaggtgtta ttaccgaaga 600
aatggccgcc agtcttttgg accagctgat cgaagaggta ctggctgata atcttcacc 660
tcctagccat ttgaaccac ctacccttca cgaactgtat gatttagacg tgacggcccc 720
cgaagatccc aacgaggagg cggtttcgca gatttttccc gactctgtaa tgttggcgtg 780
gcaggaaggg attgacttac tcacttttcc gccggcgccc ggttctccgg agccgcctca 840

```



```

cctttcccg cagccccgagc agccggagca gagagccttg ggtccgggtt ctatgccaaa 900
ccttgtaccg gaggtgatcg atcttaccctg ccacgaggct ggctttccac ccagtgcaga 960
cgaggatgaa gaggggtgagg agtttgtgtt agattatgtg gagcaccocg ggcacgggtg 1020
cagggtctgt cattatcacc ggaggaatac gggggaccca gatattatgt gttcgccttg 1080
ctatatgagg acctgtggca tgtttgtcta cagtaagtga aaattatggg cagtgggtga 1140
tagagtgggt ggtttgggtg ggttaatttt ttttaattt ttacagttt gtggtttaa 1200
gaattttgta ttgtgatttt tttaaaaggt cctgtgtctg aacctgagcc tgagcccgag 1260
ccagaaccgg agcctgcaag acctaccgc cgtcctaaaa tggcgccctg taccctgaga 1320
cgcccgacat cacctgtgtc tagagaatgc aatagtagta cggatagctg tgactccggt 1380
ccttctaaca cacctcctga gatacaccgc gtggtcccg cgtgccccat taaaccagtt 1440
gccgtgagag ttggtgggag tgcggaggct gtggaatgta tcgaggactt gcttaacgag 1500
cctgggcaac ctttggaact gagctgtaaa cgccccaggc cataaggtgt aaacctgtga 1560
ttgctgtgtt ggttaacgcc tttgtttgct gaatgagttg atgtaagttt aataaagggt 1620
gagataatgt ttaacttgca tggcgtgtta aatggggcgg ggcttaaaagg gtatataatg 1680
cgccgtgggc taactttggt tacatctgac ctcatggagg cttgggagtg tttggaagt 1740
ttttctgtg tgcgtaactt gctggaacag agctctaaca gtacctcttg gttttggagg 1800
tttctgtgg gctcatccca ggcaagttt gctgcagaa ttaaggagga ttacaagtgg 1860
gaatttgaag agcttttgaa atcctgtggt gagctgtttg attctttgaa tctgggtcac 1920
caggcgcttt tccaagagaa ggtcatcaag actttggatt tttccacacc ggggcgcgct 1980
gcggctgctg ttgctttttt gagttttata aaggataaat ggagcgaaga aacctatctg 2040
agcggggggg acctgctgga ttttctggcc atgcatctgt ggagagcggt tgtgagacac 2100
aagaatcgcc tgctactgtt gtctccgctc cgcccgccga taataccgac ggaggagcag 2160
cagcagcagc agggaggaagc caggcgccgg cgccaggagc agagcccatg gaacccgaga 2220
gccggcctgg accctcgga atgaatgtt tacaggtggc tgaactgtat ccagaactga 2280
gacgcatttt gacaattaca gaggatgggc aggggctaaa gggggtaaa agggagcggg 2340
gggcttgtga ggctacagag gaggctagga atctagcttt tagcttaatg accagacacc 2400
gtcctgagtg tattactttt caacagatca aggataatg cgctaagtga cttgatctgc 2460
tggcgagaa gtattccata gagcagctga ccacttactg gctgcagcca ggggatgatt 2520
ttgagggagc tattagggta tatgcaagg tggcacttag gccagattgc aagtacaaga 2580
tcagcaaaact tgtaaatatc aggaattgtt gctacatttc tgggaacggg gccgaggtgg 2640
agatagatac ggaggatagg gtggccttta gatgtagcat gataaatatg tggccggggg 2700
tgcttggcat ggacgggggt gttattatga atgtaagggt tactggcccc aattttagcg 2760
gtacgggttt cctggccaat accaacctta tctacacgg tgtaagcttc tatgggttta 2820
acaatacctg tgtggaagcc tggaccgatg taagggttcg gggctgtgct ttttactgct 2880
gctggaaggg ggtggtgtgt cgccccaaa gcagggttc aattaagaaa tgcctctttg 2940
aaaggtgtac cttgggtatc ctgtctgagg gtaactccag ggtgcgccac aatgtggcct 3000
ccgactgtgg ttgcttcatg ctagtgaata gcgtggctgt gattaagcat aacatggat 3060
gtggcaactg cgaggacagg gcctctcaga tctgacctg ctcggacggc aactgtcac 3120
tgctgaagac cattcacgta gccagccact ctcgcaaggc ctggccagtg tttgagcata 3180
acatactgac ccgctgttcc ttgcatttgg gtaacaggag gggggtgttc ctaccttacc 3240
aatgcaattt gagtcacat aagatattgc ttgagcccga gagcatgtcc aaggtgaac 3300
tgaacgggtt gtttgacatg acctgaaga tctggaagg gctgaggtac gatgagacc 3360
gcaccagggt cagacctgc gagtgtggcg gtaaacatat taggaaccag cctgtgatgc 3420
tggatgtgac cgaggagctg aggcccgatc acttgggtgt ggcctgcacc cgcgtgagt 3480
ttggctctag cgatgaagat acagattgag gtactgaaat gtgtggcggt ggcttaaggg 3540
tgggaaagaa tatataagg ggggtcttta ttagttttt tatctgttt gcagcagccg 3600
ccgccgcat gagcaccaac tctgttgatg gaagcattgt gagctcatat ttgacaaccg 3660
gcatgcccc atgggcccgg gtgcgtcaga atgtgatgg ctccagcatt gatggtcgcc 3720
ccgtcctgcc cgcaaaactc actaccttga cctacgagac cgtgtctgga acgcccgttg 3780
agactgcagc ctccgcgcgc gcttcagccg ctgcagccac cgcccgcggg attgtgactg 3840
actttgcttt cctgagcccg cttgcaagca gtgcagcttc ccgttcaccc gcccgcatg 3900
acaagttgac ggctcttttg gcacaattgg attctttgac ccgggaactt aatgtcgtt 3960
ctcagcagct gttggtatcg cgccagcagg tttctgccct gaaggcttcc tcccctccca 4020
atgcggttta aaacataaat aaaaaaccag actctgtttg gatttggatc aagcaagtgt 4080
cttgcgtctc ttatttaggg gttttgcg cgcggtaggc ccgggaccag cgtctcgg 4140
cgttgaggtt cctgtgtatt ttttccagga cgtggtaaag gtgactctgg atgttcagat 4200
acatgggcat aagcccgctc ctgggtgga ggtagcacca ctgcagagct tcatgtctgc 4260
gggtggtgtt gtagatgatc cagtcgtagc aggagcgctg ggcgtggtgc ctaaaaatgt 4320
ctttcagtag caagctgatt gccaggggca ggcccttgg gtaagtgtt acaaagcggt 4380
taagctggga tgggtgcata cgtggggata tgagatgcat cttggactgt atttttaggt 4440
tggctatgtt cccagccata tccctccggg gattcatgtt gtgcagaacc accagcacag 4500
tgtatccggt gcacttgga aatttgcac gtagcttaga aggaaatgcg tggaagaact 4560
tggagacgcc cttgtgacct ccaagatttt ccatgcattc gtccataatg atggcaatgg 4620
gccacgggc ggcggcctgg gcgaagatat ttctgggatc actaacgtca tagttgtgtt 4680
ccaggtgag atcgtcatag gccattttta caaagcgcg gcggagggtg ccagactgcg 4740
gtataatggt tccatccggc ccaggggcgt agttaccctc acagatttgc atttccacg 4800

```

```

ctttgagttc agatgggggg atcatgtcta cctgcggggc gatgaagaaa acggtttccg 4860
gggtagggga gatcagctgg gaagaaaagca ggttcctgag cagctgcgac ttaccgcagc 4920
cgggtggggccc gtaaatcaca cctattaccg ggtgcaactg gtagttaaga gagctgcagc 4980
tgccgtcatc cctgagcagg gggggcactt cgtaagcat gtccctgact cgcagtgttt 5040
ccctgaccaa atccgccaga aggcgctcgc cgcccagcga tagcagttct tgcaaggaag 5100
caaagttttt caacggtttg agaccgtccg ccgtaggcat gcttttgagc gtttgaccaa 5160
gcagttccag gcggtcccac agctcggtea cctgctctac ggcatctcga tccagcatat 5220
ctcctcgttt cgcgggttgg ggcggtttt gctgtacggc agtagtcggt gctcgtccag 5280
acggggccagg gtcagtgtct tccacgggag cagggtcctc gtcagcgtag tctgggtcac 5340
ggtgaagggg tgcgctccgg gctgcgcgct ggccagggtg cgcttgaggc tggctctgct 5400
ggtgctgaag cgctgccggg cttcgccttg cgcgtcggcc aggtagcatt tgaccatggt 5460
gtcatagtcc agcccctccg cggcgtggcc cttggcgcgc agcttgccct tggaggaggc 5520
gccgcacgag gggcagtgca gacttttgag ggcgtagagc ttgggcgcga gaaataccga 5580
ttccggggag taggcatccg cgccgcaggc ccgcgacagc gtctcgcat ccacgagcca 5640
ggtgagctct ggccgttcgg ggtcaaaaac caggtttccc ccatgctttt tgatgcgttt 5700
cttactctct gtttccatga gcggtgttcc acgctcgggt acgaaaaggc tgtccgtgtc 5760
cccgatatac gacttgagag gcctgtcctc gagcgggtgt ccgcggtcct cctcgtatag 5820
aaactcggac cactctgaga caaaggctcg cgtccaggcc agcacgaagg aggctaagt 5880
ggaggggtag cggctcgtgt ccactagggg gtccactcgc tccagggtgt gaagacacat 5940
gtcgcctctc tcggcatcaa ggaaggtgat tggttttag tagtaggcca cgtgaccggg 6000
tgttcctgaa ggggggctat aaaaaggggt gggggcgctg tcgtcctcac tctcttccgc 6060
atcgctgtct gcgaggggcca gctgttgggg tagtactcc ctctgaaaag cgggcatgac 6120
ttctgcgcta agattgtcag ttccaaaaa cgaggaggat ttgatattca cctggcccgc 6180
ggtgatgcct ttgagggtgg ccgcatccat ctggtcagaa aagacaatct tttgtgtc 6240
aagcttggtg gcaaacgacc cgtagagggc gttggacagc aacttgccga tggagcgag 6300
ggtttgggtt ttgtcgcgat cggcgcgctc cttggccgag atgtttagct gcacgtattc 6360
gcgcgcaacg caccgccatt cgggaaagac ggtggtgcgc tcgtcgggca ccagggtcac 6420
gcgccaaccg cggttgtgca ggggtgacaag gtcaacgctg gtggctacct ctccgctgag 6480
gcgctcgttg gtcacgcaga ggcggccgccc cttgcgcgag cagaatggcg gtagggggtc 6540
tagctcgttc tcgtccgggg ggtcgtcgtc cacggtaaag accccgggca gcaggcgcg 6600
gtcgaagtag tctatcttgc atccttgcaa gtctagcgcc tgctgccatg cgcgggcggc 6660
aagcgcgcgc tcgtatgggt tgagtggggg acccatggc atgggggtgg tgagcgcgga 6720
ggcgtacatg ccgcaaatgt cgtaaaagta gaggggctct ctgagtattc caagatatgt 6780
agggtagcat cttccaccgc ggtgctggc gcgcacgtaa tcgtatagtt cgtgcgagg 6840
agcgaggagg tcgggaccga ggttgctacg ggccggctgc tctgctcggg agactatctg 6900
cctgaagatg gcatgtgagt tggatgatat ggttgagcgc tggaaagcgt tgaagctggc 6960
gtctgtgaga cctaccgctg cacgcacgaa ggaggcgtag gtagtcgcga gcttgttagc 7020
cagctcggcg gtgacctgca cgtctagggc gcagtagtcc agggtttccct tgatgagtc 7080
atacttatcc tgtccctttt ttttccacag ctgcggttg aggacaaact cttcgcggtc 7140
tttccagtac tcttgatcg gaaaccgctc ggcctccgaa cggtaaagac ctgagcatgta 7200
gaactggttg acggcctggt aggcgcagca tcccttttct acgggtagcg cgtatgcctg 7260
cgcgcccttc cggagcgagg tgtgggtgag cgcaaggtg tccctgacca tgactttgag 7320
gtactggtat ttgaagtcag tgtcgtcgca tccgcccctg tcccagagca aaaagtccgt 7380
gcgctttttg gaaacgagat ttggcagggc gaaggtgaca tcggtgaaga gtatctttcc 7440
cgcgcgaggc ataaagtgc gtgtgatgag gaaggggtccc ggcacctcg aacggttgtt 7500
aattacctgg gcggcgagca cgtctcgtc aaagccgttg atgttgtgg ccacaatgta 7560
aagttccaag aagcgcgga tgccttgat ggaaggcaat tttttaagtt cctcgtaggt 7620
gagctcttca ggggagctga gcccgtgctc tgaagggcc cagctcgtca gatgagggtt 7680
ggaagcgacg aatgagctcc acaggtcacg ggcattagc atttgacggt ggtcgcgaaa 7740
ggtcctaana tggcgaccta tggccatttt ttctgggtg atgcagtag agttaagcgg 7800
gtcttgttcc cagcgttccc atccaagggt cgcggctagg tctcgcgcgg cagtcactag 7860
aggctcatct ccgccaact tcatgaccag catgaagggc acgagctgct tcccaaaggc 7920
ccccatcaa gtataggtct ctacatcgta ggtgacaaag agacgctcgg tgcgaggatg 7980
cgagccgatc gggaagaact ggtctctccg ccaccaattg gaggagtggc tattgatgtg 8040
gtgaaagtag aagtcctgc gacgggcccga acactcgtgc tggcttttgt aaaaacgtgc 8100
gcagtactgg cagcgtgca cgggctgtac atcctgcacg aggttgacct gacgaccgcg 8160
cacaaggaag cagagtggga atttgagccc ctgcctggc gggtttggct ggtggtcttc 8220
tacttcggct gcttgtcctt gaccgtctgg ctgctcgagg ggaattacgg tggatcggac 8280
caccacggcg cgcgagccca aagtccagat gtccgcgcgc ggcggtcgga gcttgatgac 8340
aacatcgcg agatgggagc tgtccatggt cttgagctcc cgcggcgtca ggtcaggcg 8400
gagctcctgc aggtttacct cgcatagacg ggtcagggag cgggctagat ccaggtgata 8460
cctaatttcc aggggctggt tgggtggcggc gtcgatggct tgcaagaggc cgcacccccg 8520
cggcgcgact acggtaccgc gcggcgggcg gttggccgag ggggtgtcct tggatgatgc 8580
atctaaaagc ggtgacgcgg gcgagccccc ggaggtaggg ggggtcccg acccgccggg 8640
agagggggca ggggcacgtc ggcggcgcg gctggtgctg cgcgcgtagg 8700
ttgctggcga acgcgacgac gcggcggttg atctcctgaa tctggcgctc ctgctgaa 8760

```

```

acgacggggc cggtagagctt gagcctgaaa gagagttcga cagaatcaat ttcggtgtcg 8820
ttgacggcgg cctggcgcaa aatctcctgc acgtctcctg agttgtcttg ataggcgatc 8880
tcggccatga actgctcgat ctcttcctcc tggagatctc cgctgccggc tcgctccacg 8940
gtggcgcgga ggtcgttga aatgcggggc atgagctgcg agaaggcgtt gaggcctccc 9000
tcgttccaga cgcgctgta gaccacgccc ccttcggcat cgcgggcgcg catgaccacc 9060
tgcgcgagat tgagctccac gtgcccggcg aagacggcgt agtttcgcag gcgctgaaag 9120
aggtagttga ggggtggtggc ggtgtgttct gccacgaaga agtacataac ccagcgctcg 9180
aacgtggatt cgttgatata ccccaaggcc tcaaggcgct ccatggcctc gtagaagtcc 9240
acggcggaagt tgaaaaactg ggagttgcgc gccgacacgg ttaactcctc ctccagaaga 9300
cggatgagct cggcgacagt gtcgcgacac tcgctgctcaa aggttacagg ggcctcttct 9360
tcttcttcaa tctctcttcc cataagggcc tccccttctt ctctctcttg cggcggtggg 9420
ggagggggga cacggcgcg acgacggcg accgggaggc ggtcgacaaa gcgctcgatc 9480
atctccccgc ggcgacggcg catggtctcg gtgacggcg gccgttctc gcgggggcgc 9540
agttggaaga cgcgcggcgt catgtcccgc ttatgggttg cgggggggct gccatgcggc 9600
agggatacgg cgctaacgat gcatctcaac aattgttgt taggtactcc gccgcggagg 9660
gacctgagcg agtccgcatc gaccgcatcg gaaaacctct cgagaaaggc gtctaaccag 9720
tcacagtcgc aaggtaggct gagcaccgtg gcgggcggca gcgggcggcg gtcggggttg 9780
tttctggcgg aggtgtgct gatgatgtaa ttaagtagg cggctctgag acggcggatg 9840
gtcgacagaa gcacctgtc cttgggtccg gcctgtgtaa tgcgcaggcg gtcggccatg 9900
ccccaggctt cgttttgaca tcggcgcgag tctttgtagt agtcttgcag gagccttctt 9960
accggcactt ctctcttccc ttcctcttgt cctgcatctc ttgcatctat cgctgcggcg 10020
gcggcgaggt ttggccgtag gtggcgccct ctctctccca tgcgtgtgac cccgaagccc 10080
ctcatcggtt gaagcagggc taggtcgcg acaacgcgct cggctaatat ggctgtctgc 10140
acctgcgtga gggtagactg gaagtcaccc atgtccacaa agcgggtgta tgcgccgtg 10200
ttgatggtgt aagtgcagtt ggcataacg gaccagttaa cggctcgttg acccgctgc 10260
gagagctcgg tgtacctgag acgcgagtaa gccctcgagt caaatacgtg gtcgttgcaa 10320
gtccgcacca ggtactggta tcccacaaa aagtgcggcg cgggctggcg gtagaggggc 10380
cagcgtaggg tggccggggc tccggggggc agatcttcca acataaggcg atgatatccg 10440
tagatgtacc tggacatcca ggtgatgccg gcggcggttg tggaggcgcg cggaaaagtc 10500
cggacgcggt tccagatgtt gcgcagcgcc aaaaagtgt ccatggtcgg gacgctctgg 10560
ccggtcaggc gcgcgcaatc gttgacgctc tagaccgtgc aaaaggagag cctgtaagcg 10620
ggcactcttc cgtggtcttg tggataaatt cgcaagggta tcatggcgga cgaccggggt 10680
tcgagccccg tatccggccg tccgcggtga tccatgcggt taccgcccgc gtgtcgaaac 10740
cagggtgtcg acgtcagaca acgggggagt gctccttttg gcttcttccc aggcgcggcg 10800
gctgtgcgc tagctttttt ggccactggc gcgcgcgacg gtaagcggtt aggttgaaa 10860
gcgaaagcat taagtggctc gctccctgta gccggagggt tattttccaa gggttgagtc 10920
gcgggacccc cggttcgagt ctccgaccgg ccggactgcg gcgaacgggg gtttgcctcc 10980
ccgtcatgca agaccccgt tgcaaatccc tccggaacaa gggacgagcc ctttttttgc 11040
ttttccaga tgcattccgt gctgcggcag atgcgcccc ctcctcagca gcggcaagag 11100
caagagcagc ggcagacatg cagggcaccc tcccctctc ctaccgcgtc aggagggcg 11160
acatcccgcg ttgacggcgc agcagatggt gattacgaac ccccgcgcg cggggcccgc 11220
cactaccttg acttgagga gggcgagggc ctggcgcgcc taggagcgcc ctctcctgag 11280
cggtaaccbaa ggtgagcgt gaagcgtgat acgcgtgagg cgtacgtgcc gcggcagaac 11340
ctgttttcgc accgcgagg agaggagccc gaggagatgc gggatcgaaa gttccacgca 11400
gggcgcgagc tgcggcatgg cctgaatcgc gagcggttgc tgcgcgagga ggactttgag 11460
cccgacgcgc gaaccgggat tagtcccgc gcgcacacg tggcgccgc cgacctgta 11520
accgcatacg agcagacggt gaaccaggag attaactttc aaaaaagctt taacaaccac 11580
gtgctacgc ttgtggcgcg cgaggagggt gctataggac tgatgcatct gtgggacttt 11640
gtaagcgcg tggagcaaaa cccaaatagc aagccgctca tggcgagctt gttccttata 11700
gtgcagcaca gcagggacaa cgaggcattc agggatgcgc tgctaaacat agtagagccc 11760
gagggccgct ggctgctcga tttgataaac atcctgcaga gcatagtggg gcaggagcgc 11820
agcttgagcc tggctgacaa ggtggccgcc atcaactatt ccatgcttag cctgggcaag 11880
ttttacgccc gcaagatata ccatacccct tacgttccca tagacaagga ggtaaagatc 11940
gaggggttct acatgcgcat ggcgctgaag gtgcttacct tgagcgacga cctgggctgt 12000
tatcgcaacg agcgcatcca caaggccgtg agcgtgagcc ggcggcgcg gctcagcgac 12060
cgcgagctga tgcacagcct gcaaagggcc ctggctggca cgggcagcgc cgatagagag 12120
gccgagctct actttgacgc gggcgctgac ctgcgctggg ccccaagccg acgcgccctg 12180
gaggcagctg gggccggacc tgggctggcg gtggcaccgc cgcgcgctgg caacgtcgcc 12240
ggcgtggagg aatatgacga ggacgatgag tacgagccag aggacggcga gtactaagcg 12300
gtgatgtttc tgatcagatg atgcaagacg caacggaccc ggcggtgcgg gcggcgctgc 12360
agagccagcc gtccggcctt aactccacgg acgactggcg ccaggtcatg gaccgcatca 12420
tgtcgctgac tgcgcgcaat cctgacgcgt tccggcagca gccgcaggcc aaccggctct 12480
ccgcaattct ggaagcgggt gtcccggcgc gcgcaaaccc cacgcacgag aaggtgctgg 12540
cgatcgtaaa cgcgctggcc gaaacaggg ccattccggc cgacgagcc ggcctggtct 12600
acgacgcgct gcttcagcgc gtggctcgtt acaacagcg caacgtgcag accaacctgg 12660
accggctggt gggggatgtg cgcgaggccg tggcgagcg tagcgcgcg cagcagcag 12720

```

gcaacctggg ctccatgggt gcactaaacg ccttcctgag tacacagccc gccaacgtgc 12780
 cgcggggaca ggaggactac accaactttg tgagcgcact gcggctaata gtgactgaga 12840
 caccgcaaaag tgaggtgtac cagtcctgggc cagactatct tttccagacc agtagacaag 12900
 gcctgcagac cgtaaacctg agccagcgct tcaaaaactt gcaggggctg tgggggggtgc 12960
 gggctccac aggcgaccgc gcgaccgtgt ctagcttgct gacgcccac tcgcgcctgt 13020
 tgctgctgct aatagcgccc ttcacggaca gtggcagcgt gtcccgggac acatacctag 13080
 gtcacttgct gacactgtac cgcgaggcca taggtcaggc gcatgtggac gagcatactt 13140
 tccaggagat tacaagtgtc agccgcgcgc tggggcagga ggacacgggc agcctggagg 13200
 caaccctaaa ctacctgtg accaaccggc ggcagaagat cccctcggtg cacagttaa 13260
 acagcgagga ggagcgcat ttgcgctacg tgcagcagag cgtgagcctt aacctgatgc 13320
 gcgacggggg aacgcccagc gtggcgctgg acatgaccgc gcgcaacatg gaaccgggca 13380
 tgtatgcctc aaaccggccg tttatcaacc gcctaattga ctacttgcat cgcgcgccg 13440
 ccgtgaaccc cgagtatttc accaatgcca tcttgaaccc gcaactggta ccgcccctg 13500
 gtttctacac cgggggattc gaggtgcccg agggtaacga tggattcctc tgggacgaca 13560
 tagacgacag cgtgttttcc ccgcaaccgc agacctgct agagttgcaa cagcgcgagc 13620
 aggcagaggg ggcgctgcga aaggaaaagc tccgcaaggc aagcagcttg tccgatctag 13680
 gcgctgcggc cccgcggtca gatgctagta gccatttcc aagcttgata gggctcttta 13740
 ccagcactcg caccaccgc ccgcgcctgc tgggcgagga ggagtaccta aacaactcgc 13800
 tgctgcagcc gcagcgcgaa aaaaacctgc ctccggcatt tcccaacaac gggatagaga 13860
 gcctagtggg caagatgagt agatggaaga cgtacgcgca ggagcacagg gacgtgccag 13920
 gcccgcgccc gccaccgct cgtcaaaagg acgaccgtca gcggggctct gtgtgggagg 13980
 acgatgactc ggcagacgac agcagcgctc tggatttggg agggagtggc aaccctgtt 14040
 cgcaccttcg ccccgagctg gggagaatgt tttaaaaaaa aaaaagcatg atgcaaaaa 14100
 aaaaactcac caaggccatg gcaccgagcg ttggttttct tgtattcccc ttagtatgcg 14160
 gcgcgcgggc atgtatgagg aaggctctcc tccctcctac gagagtgtgg tgagcgcggc 14220
 gccagtggcg gcggcgctgg gttctccctt cgtatgctcc ctggaccgcg cgtttgtgcc 14280
 tccgcggtac ctgcgccta ccggggggag aaacagcatc cgttactctg agttggcacc 14340
 cctattcgac accaccctg tgtaacctgt ggacaacaag tcaacgatg tggcatccct 14400
 gaactaccag aacgaccaca gcaactttct gaccacggtc attcaaaaaca atgactacag 14460
 cccgggggag gcaagcacac agaccatcaa tcttgacgac cggtcgcact gggcgggcga 14520
 cctgaaaacc atcctgcata ccaacatgcc aaatgtgaac gagttcatgt ttaccaataa 14580
 gtttaaggcg cggtgatgg tgctgcgctt gcctactaag gacaatcagg tggagctgaa 14640
 atacgagtg gtggagtcca cgtcgccga gggaactac tccgagacca tgaccataga 14700
 ccttatgaac aacgcgatcg tggagacta cttgaaagt ggacagaca acggggttct 14760
 ggaaagcgac atcggggtaa agtttgacac ccgcaacttc agactggggg ttgacccctg 14820
 cactggtctt gtcatgctg ggttatatac aaacgaagcc ttccatccag acatcattt 14880
 gctgccagga tgcggggtgg acttcaccca cagccgcctg agcaactgt tgggcatccg 14940
 caagcggaac cccttcagg agggcttag gatcacctac gatgatctgg aggggtgtaa 15000
 cattcccgca ctgttgatg tggacgcta ccaggcgagc ttgaaagatg acaccgaaca 15060
 gggcgggggg ggcgcagcg gcagcaacag cagtggcagc ggcgcggaag agaactccaa 15120
 cgcgcgagcc gcggcaatgc agccggtgga ggacatgaac gatcatgcca ttcgcgcgca 15180
 cacctttgcc acaggggctg aggagaagcg cgctgagggc gaagcagcgg ccgaagctgc 15240
 cgcccccgct gcgcaaccg aggtcgagaa gcctcagaag aaaccggtga tcaaaacct 15300
 gacagaggac agcaagaaac gcagttacaa cctaataagc aatgacagca ccttcaccca 15360
 gtaaccgagc tggtagcttg catacaacta cggcgaccct cagaccggaa tccgctcatg 15420
 gacctgtct tgcactcctg acgtaacctg cggtcggag caggtctact ggtcggtgcc 15480
 agacatgat caagaccgg tgaccttcg ctccacgcgc cagatcagca actttccggt 15540
 ggtggcgcc gagctgttg ccgtgcactc caagagcttc tacaacgacc aggcgctcta 15600
 ctcccaacte atccgccagt ttacctctct gacccacgtg ttcaatcgct tccccgagaa 15660
 ccagattttg gcgcgcccgc cagccccac catcaccacc gtcagtgaac acgttctg 15720
 tctcacagat cacgggacgc taccgctgcg caacagcatc ggaggagtcc agcagtgac 15780
 cattactgac gccagacgcc gcacctgccc ctacgtttac aaggccctgg gcatagtctc 15840
 gccgcgcgtc ctatcgagcc gcaacttttg agcaagcatg tccatcctta tatcgcccag 15900
 caataacaca ggctggggcc tgcgcttccc aagcaagatg tttggcgggg ccaagaagcg 15960
 ctccgacca cacccagtg gcgtgcgcgg gcaactaccg gcgcctggg gcgcgcacaa 16020
 acgcgcgcgc actggggcga ccaccgtcga tgacgccatc gacgcggtgg tggaggaggc 16080
 gcgcaactac acgcccacgc cgccaccagt gtccacagt gacgcggcca ttcagaccgt 16140
 ggtgcgcgga gcccgcgct atgctaaaat gaagagacgg cgaggcgcg tagcacgtcg 16200
 ccaccgccc gcacccggca ctgcccga acgcgcggcg gcggccctgc ttaaccgcgc 16260
 acgtgcacac ggccgacggg cgccatgcg ggccgctcga aggctggccg cgggtattgt 16320
 cactgtgccc cccaggtcca ggcgacgagc ggccgcccga gcagccgcg ccattagtgc 16380
 tatgactcag ggtcgaggg gcaacgtgta ttgggtgcgc gactcggtta gcgcctg 16440
 cgtgcccggt gcgaccggc ccccgcgcaa ctgattgca agaaaaaact acttagactc 16500
 gtactgttgt atgtatccag ggcgcgcggc gcgcaacgaa gctatgtcca agcgcaaaat 16560
 caaagaagag atgctccagg tcatcgcgcc ggagatctat ggcccccgga agaaggaaga 16620
 gcaggattac aagccccgaa agctaaagcg ggtcaaaaag aaaaagaaag atgatgatga 16680

tgaacttgac	gacgaggtgg	aactgctgca	cgctaccgcg	cccaggcgac	gggtacagtg	16740
gaaaggtcga	cgcgtaaaac	gtgtttttg	acccggcacc	accgtagtct	ttacgcccgg	16800
tgagcgctcc	acccgcacct	acaagcgct	gtatgatgag	gtgtacggcg	acgaggacct	16860
gcttgagcag	gccaacgagc	gcctcgggga	gtttgcctac	ggaaagcggc	ataaggacat	16920
gctggcggtg	ccgctggagc	agggcaaccc	aacacctagc	ctaaagcccc	taacactgca	16980
gcaggtgctg	cccgcgcttg	caccgtccga	agaaaaagcg	ggcctaaagc	gcgagtctgg	17040
tgacttggca	cccaccgtgc	agctgatggt	acccaagcgc	cagcgactgg	aagatgtctt	17100
ggaaaaaatg	accgtggaac	ctgggctgga	gcccgaagtc	cgcggtcgcc	caatcaagca	17160
ggtggcgccg	ggactgggcg	tgcagaccgt	ggacgttcag	ataccacta	ccagtagcac	17220
cagtattgcc	accgccacag	agggcatgga	gacacaaacg	tccccggttg	cctcagcggt	17280
ggcggatgcc	gcggtgcagg	cggtcgctgc	ggccgcgtcc	aagacctcta	cggaggtgca	17340
aacggaccgg	tggtatgttc	gcgtttcagc	cccccgccgc	ccgcgcggtt	cgaggaagta	17400
cggcgccgcc	agcgcgctac	tgcccgaata	tgccctacat	ccttccattg	cgccctacccc	17460
cggctatcgt	ggctacacct	accgccccag	aagacgagca	actaccgcac	gccgaaccac	17520
cactggaacc	cgccgcgcgc	gtcgccgtcg	ccagcccgtg	ctggccccga	tttccgtcgc	17580
cagggtggct	cggaaggag	gcaggacct	ggtgctgcca	acagcgcgct	accaccccag	17640
catcgtttaa	aagccggtct	ttgtggttct	tgcagatatg	gccctcacct	gccgcctccg	17700
tttcccgggtg	ccgggattcc	gaggaagaat	gcaccgtagg	aggggcatgg	ccggccacgg	17760
cctgacgggc	ggcatgcgtc	gtgcgcacca	ccggcgccgg	cgcgcgctcg	accgtcgcat	17820
gcgcggcggt	atcctgcccc	tccttatctc	actgatcgcc	gcggcgattg	gcgccgtgcc	17880
cggaattgca	tccgtggcct	tgcaggcgca	gagacactga	ttaaaaacaa	gttgcatgtg	17940
gaaaaatcaa	aataaaaagt	ctggactctc	acgctcgctt	ggtcctgtaa	ctattttgta	18000
gaatggaaga	catcaacttt	gcgtctctgg	ccccgcgaca	cggtctcgcg	ccgttcctgg	18060
gaaactggca	agatatcggc	accagcaata	tgagcggtgg	cgccctcagc	tggggctcgc	18120
tgtggagcgg	cattaaaaat	ttcggttcca	ccgttaagaa	ctatggcagc	aaggcctgga	18180
acagcagcac	aggccagatg	ctgagggata	agttgaaaga	gcaaaatttc	caacaaaagg	18240
tggtagatgg	cctggcctct	ggcattagcg	gggtggtgga	cctggccaac	caggcagtg	18300
aaaataagat	taacagtaag	cttgatcccc	gccctcccgt	agaggagcct	ccaccggccg	18360
tggagacagt	gtctccagag	ggcggtggcg	aaaagcgctc	gcgccccgac	agggaaagaa	18420
ctctggtgac	gcaaatagac	gagcctccct	cgtacgagga	ggcactaaag	caaggcctgc	18480
ccaccacccg	tcccatcgcg	cccatggcta	ccggagtgtc	gggcccagcac	acacccgtaa	18540
cgctggacct	gcctcccccc	gccgacaccc	agcagaaacc	tgtgtgcca	ggcccagacc	18600
ccgttgttgt	aacccgtcct	agccgcgcgt	ccctgcgcgc	cgccgccagc	ggtcccgcat	18660
cgttgcggcc	cgtagccagt	ggcaactggc	aaagcacact	gaacagcatc	gtgggtctgg	18720
gggtgcaatc	cctgaagcgc	cgacgatgct	tctgaatagc	taacgtgtcg	tatgtgtgtc	18780
atgtatgcgt	ccatgtcgcc	gccagaggag	ctgctgagcc	gccgcgcgcg	cgctttccaa	18840
gatggctacc	ccttcgatga	tgccgcagtg	gtcttacctg	cacatctcgg	gccaggacgc	18900
ctcgagtagc	ctgagccccg	ggctggtgca	gtttgcccg	gccaccgaga	cgtacttcag	18960
cctgaataac	aagtttagaa	acccacgggt	ggcgccctac	cacgacgtga	ccacagaccg	19020
gtcccagcgt	ttgacgctgc	ggttcatccc	tgtggaccgt	gaggatactg	cgtactcgta	19080
caaggcgccg	ttcacccctag	ctgtgggtga	taaccgtgtg	ctggacatgg	cttccacgta	19140
ctttgacatc	cgcgcgctgc	tggacagggg	ccctactttt	aagccctact	ctggcactgc	19200
ctacaacgcc	ctggctccca	aggggtgccc	aaatccttgc	gaatgggatg	aagctgctac	19260
tgctcttgaa	ataaacctag	aagaagagga	cgatgacaac	gaagacgaag	tagacgagca	19320
agctgagcag	caaaaaactc	acgtattttg	gcaggcgcc	tattctggta	taaatattac	19380
aaaggaggtg	attcaaatag	gtgtcgaagg	tcaaacacct	aaatatgccg	ataaaacatt	19440
tcaacctgaa	cctcaaatag	gagaatctca	gtggtacgaa	actgaaatta	atcatgcagc	19500
tgggagagtc	cttaaaaaga	ctaccccaat	gaaaccatgt	tacggttcat	atgcaaaacc	19560
cacaaatgaa	aatggagggc	aaggcattct	tgtaaaagca	caaaatggaa	agctagaaag	19620
tcaagtggaa	atgcaatttt	tctcaactac	tgaggcgacc	gcaggcaatg	gtgataaact	19680
gactcctaaa	gtggtattgt	acagtgaaga	tgtagatata	gaaaccccag	acactcatat	19740
ttcttacctg	cccactatta	aggaaggtaa	ctcacgagaa	ctaattggcc	aacaatctat	19800
gcccacacgg	cctaattaca	ttgcttttag	ggacaatttt	attggtctaa	tgtattacaa	19860
cagcacgggt	aatatgggtg	ttctggcggg	ccaagcatcg	cagttgaatg	ctggtgtaga	19920
tttgcaagac	agaaacacag	agctttcata	ccagcttttg	cttgattcca	ttggtgatag	19980
aaccaggtac	ttttctatgt	ggaatcaggc	tgttgacagc	tatgatccag	atgttagaat	20040
tattgaaaat	catggaactg	aagatgaact	tccaaattac	tgctttccac	tgggaggtgt	20100
gattaataca	gagactctta	ccaaggtaaa	acctaataca	ggtcaggaaa	atggatggga	20160
aaaagatgct	acagaatttt	cagataaaaa	tgaaataaga	gttggaataa	attttgccat	20220
ggaaatcaat	ctaaatgcc	acctgtggag	aaatttcctg	tactccaaca	tagcgctgta	20280
tttgcccgac	aagctaaagt	acagtccttc	caacgtaaaa	atttctgata	acccaaacac	20340
ctacgactac	atgaacaagc	gagtggtggc	tcccgggtta	gtggactgct	acattaacct	20400
tggagcacgc	tggtcccttg	actatatgga	caacgtcaac	ccatttaacc	accaccgcaa	20460
tgctggcctg	cgctaccgct	caatgttgct	gggcaatggg	cgctatgtgc	ccttccacat	20520
ccaggtgcct	cagaagttct	ttgccattaa	aaacctcctt	ctcctgccgg	gctcatcac	20580
ctacgaagtg	aacttcagga	aggatgttaa	catggttctg	cagagctccc	taggaaatga	20640

cctaaggggt	gacggagcca	gcattaagtt	tgatagcatt	tgcctttacg	ccacctttctt	20700
ccccatggcc	cacaacaccg	cctccacgct	tgaggccatg	cttagaaacg	acaccaacga	20760
ccagtccttt	aacgactatc	tctccgccgc	caacatgctc	tacctatac	ccgccaacgc	20820
taccaacgtg	cccataatcca	tcccctccc	caactgggcg	gctttccgcg	gctgggcctt	20880
cacgcgcctt	aagactaagg	aaaccccatc	actgggctcg	ggctacgacc	cttattacac	20940
ctactctggc	tctataccct	acctagatgg	aaccttttac	ctcaaccaca	cctttaagaa	21000
gggtggccatt	acctttgact	cttctgtcag	ctggcctggc	aatgaccgcc	tgcttaccgc	21060
caacgagttt	gaaattaagc	gctcagttga	cggggagggg	tacaacgttg	ccagtgtaa	21120
catgacccaaa	gactggttcc	tggtacaaat	gctagctaac	tacaacattg	gctaccaggg	21180
cttctatatac	ccagagagct	acaaggaccg	catgtactcc	ttcttttagaa	acttccagcc	21240
catgagccgt	caggtgggtg	atgatactaa	atacaaggac	taccaacag	tgggcatcct	21300
acaccaaacac	aacaactctg	gatttgttgg	ctaccttgcc	cccaccatgc	gcgaaggaca	21360
ggcctaccct	gctaaacttcc	cctatccgct	tataggcaag	accgcagttg	acagcattac	21420
ccagaaaaag	tttctttgcg	atcgcacctt	ttggcgcatc	ccattctcca	gtaactttat	21480
gtccatgggc	gcactcacag	acctggggcca	aaacctttctc	tacgccaact	ccgcccacgc	21540
gctagacatg	acttttgagg	tggtatcccat	ggacgagccc	acccttcttt	atgttttgtt	21600
tgaagtcttt	gacgtggtcc	gtgtgcaccg	gccgcaccgc	ggcgctcatcg	aaaccgtgta	21660
cctgcgcacg	cccttctcgg	ccggcaacgc	cacaacataa	agaagcaagc	aacatcaaca	21720
acagctgccg	ccatgggctc	cagtgagcag	gaactgaaag	ccattgtcaa	agatcttggg	21780
tgtgggcat	attttttggg	cacctatgac	aagcgctttc	caggctttgt	ttctccacac	21840
aagctcgct	gcgccatagt	caatacggcc	ggtcgcgaga	ctggggggcg	acactggatg	21900
gccttttgct	ggaacccgca	ctcaaaaaca	tgctacctct	ttgagccctt	tggtctttct	21960
gaccagcgac	tcaagcaggt	ttaccagttt	gagtagcagt	cactcctgcg	ccgtagcgcc	22020
attgcttctt	cccccgaccg	ctgtataacg	ctggaagagt	ccacccaag	cgtagcggg	22080
cccaactcgg	ccgcctgtgg	actattctgc	tgcatgtttc	tccacgcctt	tgccaactgg	22140
ccccaaactc	ccatggatca	caaccccacc	atgaacctta	ttaccggggg	acccaactcc	22200
atgctcaaca	gtccccaggt	acagcccacc	ctgcgtcgca	accaggaaca	gctctacagc	22260
ttcctggagc	gccactcgcc	ctacttccgc	agccacagtg	cgagatttag	gagcgccact	22320
tctttttgtc	acttgaaaaa	catgtaaaaa	taatgtacta	gagacacttt	caataaaggc	22380
aaatgctttt	atttgtacac	tctcggtgga	ttatttacc	ccacccttgc	cgtctgcgc	22440
gtttaaaaat	caaaggggtt	ctgccgcgca	tcgctatgcg	ccactggcag	ggacacgttg	22500
cgatactggt	gtttagtgtc	ccacttaaac	tcaggcaca	ccatccgcg	cagctcgggt	22560
aagtttttcac	tccacaggct	gcgcaccatc	accaacgcgt	ttagcagggt	gggcgcgcat	22620
atcttgaagt	cgcagttggg	gcctccgcgc	tgccgcgcgc	agttgcgata	cacagggttg	22680
cagcaatgga	acactatcag	cgccgggtgg	tgacgcgtgg	ccagcacgct	cttgtcggag	22740
atcagatccg	cgtccagggt	ctccgcgttg	ctcagggcga	acggagtcaa	ctttggtagc	22800
tgccctccca	aaaaggggcg	gtgcccaggc	tttgagttgc	actcgcaccg	tagtggcatc	22860
aaaagggtgac	cgtgcccggg	ctgggcgtta	ggatacagcg	cctgcataaa	agccttgatc	22920
tgcttaaaag	ccacctgagc	ctttgcgcct	tcagagaaga	acatgccgca	agacttgccg	22980
gaaaactgat	tgcccggaaca	ggccgcgtcg	tgacgcgacg	accttgcgtc	gggtgtggag	23040
atctgcacca	catttcggcc	ccaccgggtc	ttcacgatct	tgcccttgct	agactgctcc	23100
ttcagcgcg	gctgcccgtt	ttcgctcgtc	acatccattt	caatcacgtg	ctccttattt	23160
atcataatgc	ttccgtgtag	acacttaagc	tcgccttcga	tctcagcgca	gcggtgcagc	23220
cacaacgcgc	agcccggtgg	ctcgtgatgc	ttgtaggtca	cctctgcaaa	cgactgcagg	23280
tacgcctgca	ggaatcgccc	catcatcgtc	acaaagggtc	tggtgctggt	gaaggtcagc	23340
tgcaacccgc	gggtgctctc	gttcagccag	gtcttgcata	cggccgccag	agcttccact	23400
tggtcaggca	gtagtttgaa	gttcgccttt	agatcgttat	ccacgtggta	cttgtccatc	23460
agcgcgcgcg	cagcctccat	gcccttcttc	cacgcagaca	cgatcggcac	actcagcggg	23520
ttcatcacgc	taatttcaact	ttccgcttcg	ctgggctctt	cctcttctct	ttgcgtccgc	23580
ataccacgcg	ccactgggtc	gtcttcatct	agccgcgcga	ctgtgcgctt	acctcctttg	23640
ccatgcttga	ttagcaccgg	tgggttgctg	aaaccaccca	ttttagcgcg	cacatcttct	23700
ctttcttctc	cgctgtccac	gattacctct	gggtgatggc	ggcgctcggg	cttgggagaa	23760
gggcgcttct	ttttcttctt	gggcgcaatg	gccaaatccg	ccgccgaggt	cgatggccgc	23820
gggctgggtg	tgccgcggcac	cagcgcgctc	tggtgatgagt	cttctctcgt	ctcggactcg	23880
atacgcggcc	tcatccgctt	ttttgggggc	gcccggggag	gcggcggcga	cggggacggg	23940
gacgacagct	cctccatggt	tgggggacgt	cgccgcgcac	cgctcgcgcg	ctcgggggtg	24000
gtttcgcgct	gctcctcttc	ccgactggcc	atttcttctt	cctataggca	gaaaaagatc	24060
atggagtcag	tcgagaagaa	ggacagccta	accgccccct	ctgagttcgc	caccaccgcc	24120
tcacccgatg	ccgccaacgc	gcctaccacc	ttcccgcgtc	aggcaccccc	gcttgaggag	24180
gaggaagtga	ttatcgagca	ggaccaggtg	tttgtaagcg	aagacgacga	ggaccgctca	24240
gtaccaacag	aggataaaaa	gcaagaccag	gacaacgcag	aggcaaacga	ggaacaaagt	24300
gggcgggggg	acgaaaggca	tgccgactac	ctagatgtgg	gagacgacgt	gctgttgaag	24360
catctgcagc	gccagtgcgc	cattatctgc	gacgcgttgc	aagagcgagc	cgatgtgccc	24420
ctcgcctatg	cggatgtcag	ccttgccctac	gaacgccacc	tattctcacc	gcgcgtacc	24480
cccaaacgcc	aagaaaacgc	cacatgcgag	cccaaccgcg	gcctcaactt	ctaccgcgta	24540
tttgccgtgc	cagaggtgct	tgccacctat	cacatctttt	tccaaaactg	caagataacc	24600

ctatcctgcc	gtgccaaaccg	cagccgagcg	gacaagcagc	tggccttgcg	gcagggcgct	24660
gtcatacctg	atatcgctc	gctcaacgaa	gtgccaaaaa	tctttgaggg	tcttgagcgc	24720
gacgagaagc	gcgcggcaaa	cgctctgcaa	caggaaaaa	gcgaaaatga	aagtcactct	24780
ggagtgttgg	tggaactcga	gggtgacaac	gcgcgcctag	ccgtactaaa	acgcagcatc	24840
gaggtcacc	actttgccta	cccggcactt	aacctacccc	ccaaggtcat	gagcacagtc	24900
atgagtgagc	tgatcgtgcg	ccgtgcgcag	cccctggaga	gggatgcaaa	tttgcaagaa	24960
caaacagagg	agggcctacc	cgcagttggc	gacgagcagc	tagcgcgctg	gcttcaaacg	25020
cgcgagcctg	ccgacttgga	ggagcgagcg	aaactaatga	tggccgcagt	gctcgttacc	25080
gtggagcttg	agtgcacgca	gcggttcttt	gctgaccccg	agatgcagcg	caagctagag	25140
gaaacattgc	actacacctt	tcgacagggc	tacgtacgcc	aggcctgcaa	gatctccaac	25200
gtggagctct	gcaacctggg	ctcctacctt	ggaattttgc	acgaaaaccg	ccttgggcaa	25260
aacgtgcttc	attccacgct	caaggcgag	gcgcgcgcg	actacgtccg	cgactgcgtt	25320
tacttatttc	tatgctacac	ctggcagacg	gccatgggcg	tttgagcagca	gtgcttgag	25380
gagtgcaccc	tcaaggagct	gcagaaactg	ctaaagcaaa	acttgaaagga	cctatggagc	25440
gccttcaacc	agcgctccgt	ggcgcgcgac	ctggcggaca	tcattttccc	cgaacgcctg	25500
cttaaaaccc	tgcaacaggg	tctgccagac	ttaccagtc	aaagcatgtt	gcagaacttt	25560
aggaacttta	tcctagagcg	ctcaggaatc	ttgcccgcga	cctgctgtgc	acttccctagc	25620
gactttgtgc	ccattaagta	ccgcgaatgc	cctccgcgcg	tttggggcca	ctgctacctt	25680
ctgcagctag	ccaactacct	tgccctaccac	tctgacataa	tggaaagcgt	gagcgggtgc	25740
ggcttactgg	agtgtcactg	tcgctgcaac	ctatgcaccc	cgaccgcctc	cctggtttgc	25800
aattcgagc	tgcttaacga	aagtcaaatt	atcggtacct	ttgagctgca	gggtccctcg	25860
cctgacgaaa	agtccgcggc	tccggggttg	aaactcactc	cggggctgtg	gacgtcggct	25920
taccttcgca	aatttgtacc	tgaggactac	cacgccacg	agattaggtt	ctacgaagac	25980
caatccccgc	cgccaaatgc	ggagcttacc	gcctgcgtca	ttaccaggg	ccacattctt	26040
ggccaattgc	aagccatcaa	caaagccgc	caagagtttc	tgctacgaaa	gggacggggg	26100
gtttacttgg	acccccagtc	cggcgaggag	ctcaacccaa	tcccccgcc	gccgcagccc	26160
tatcagcagc	agccgcgggc	ccttgcttcc	caggatggca	cccaaaaaga	agctgcagct	26220
gccgcggcca	cccacggacg	aggaggaata	ctgggacagt	caggcagagg	aggttttga	26280
cgaggaggag	gaggacatga	tggaagactg	ggagagccta	gacgaggaag	cttccgaggt	26340
cgaagagggtg	tcagacgaaa	caccgtcacc	ctcggtcgca	ttccctcgc	cggcgcccc	26400
gaaatcgga	accggttcca	gcattgctac	aacctccgct	cctcaggcgc	cgccggcaact	26460
gcccgttctgc	cgaccaaac	gtagatggga	caccactgga	accaggggcg	gtaagtccaa	26520
gcagccggcg	ccgttagccc	aagagcaaca	acagcgccaa	ggctaccgct	catggcgcg	26580
gcacaagaac	gccatagttg	cttgcttgca	agactgtggg	ggcaacatct	ccttcgccc	26640
ccgctttctt	ctctaccatc	acggcggtgg	cttccccctg	aacatcctgc	attactaccg	26700
tcctctctac	agccataact	gcaccggcgg	cagcggcagc	ggcagcaaca	gcagcgccga	26760
cacagaagca	aaggcgaccg	gatagcaaga	ctctgacaaa	gcccagaaga	tccacagcgg	26820
cggcagcagc	aggaggagga	gcgtgcgtc	tggcgcccaa	cgaaccgcta	tcgaccgcg	26880
agcttagaaa	caggattttt	cccactctgt	atgctatatt	tcaacagagc	aggggccaag	26940
aacaagagct	gaaaataaaa	aacaggtctc	tgcatccct	caccgcagc	tgctgtatc	27000
acaaaagcga	agatcagctt	cggcgcacgc	tggaaagcgc	ggaggctctc	ttcagtaaat	27060
actgcgcgct	gactcttaag	gactagtctt	gcgccttttc	tcaaatttaa	gcgcgaaaa	27120
tacgtcatct	ccagcgccca	caccggcgcg	cagcacctgt	cgtcagcgcc	attatgagca	27180
aggaaattcc	cacgccctac	atgtggagtt	accagccaca	aatgggactt	gcggctggag	27240
ctgcccaga	ctactcaacc	cgaataaact	acatgagcgc	gggacccac	atgatattcc	27300
gggtcaacgg	aatccgcgcc	caccgaaacc	gaattctctt	ggaacaggcg	gctattacca	27360
ccacacctcg	taataacctt	aatccccgta	gttgccccgc	tgccctgggt	taccaggaaa	27420
gtcccgctcc	caccactgtg	gtacttccca	gagacgcca	ggccgaagtt	cagatgacta	27480
actcaggggc	gcagcttgcg	ggcggttttc	gtcacagggt	gcggtcgccc	gggcagggta	27540
taactcacct	gacaatcaga	ggcgaggta	ttcagctcaa	cgacgagtcg	gtgagctcct	27600
cgcttggctc	ccgtccggac	gggacatttc	agatcggcgg	cgccggccgt	ccttcattca	27660
cgctcgtca	ggcaatccta	actctgcaga	cctcgtcctc	tgagccgcgc	cttgagggca	27720
ttggaactct	gcaatttatt	gaggagtttg	tgccatcggt	ctactttaac	cccttctcgg	27780
gacctccccg	ccactatccg	gatcaattta	ttcctaactt	tgacgcggta	aaggactcgg	27840
cgagcggtcg	cgactgataa	ttaagtggag	aggcagagca	actgcgcctg	aaacacctgg	27900
tccactgtcg	ccgccacaag	tgctttgccc	gcgactccgg	tgagtgttgc	tactttgaat	27960
tgcccgagga	tcataatcgag	gatctttggt	gccatctctg	tgctgagtat	aataaataca	28020
gaaattaaaa	tatactgggg	ctcctatcgc	catcctgtaa	acgccaccgt	cttcaccccg	28080
ccaagcaaac	caaggcgaa	cttacctggt	acttttaaca	tctctccctc	tgtgatttac	28140
aacagtttca	accagacgg	agtgagtcta	cgagagaacc	tctccgagct	cagctactcc	28200
atcagaaaaa	acaccaccct	ccttacctgc	cggaacgta	cccttaatta	aaagtcaggc	28260
ttcctggatg	tcagcatctg	actttggcca	gcacctgtcc	cgcgattttg	ttccagttcca	28320
actacagcga	cccaccctaa	cagagatgac	caacacaacc	aacgcggcgg	ccgctaccgg	28380
acttacatct	accacaaata	cagcccaagt	ttctgccttt	gtcaataaact	gggataaact	28440
gggcatgtgg	tggttctcca	tagcgcttat	gtttgtatgc	cttattatta	tgtggctcat	28500
ctgctgccta	aagcgcaaac	gcgcccggac	acccatctat	agtcccatca	ttgtgctaca	28560

cccaacaat gatggaatcc atagattgga cggactgaaa cacatgttct tttctcttac 28620
agtatgatta aatgagatta attaaggaat tctgtccag tttattcagc agcaccctct 28680
tgccctcctc ccagctctgg tattgcagct tctcctggc tgcaaaacttt ctccacaatc 28740
taaatggaat gtcagtttcc tctgttctc gtccatccgc acccactatc ttcattgtgt 28800
tgagatgaa gcgcgcaaga ccgtctgaag ataccttcaa ccccggtgat ccataatgaca 28860
cggaaaccgg tctccaact gtgccttttc ttactcctcc ctttgtatcc cccaatgggt 28920
ttcaagagag tccccctggg gtactctctt tgccctatc cgaacctcta gttacctcca 28980
atggcatgct tgcgctcaaa atgggcaacg gcctctctct ggacgaggcc ggcaacctta 29040
cctcccaaaa tgaaccact gtgagccac ctctcaaaaa aaccaagtca aacataaacc 29100
tggaatatc tgcacccctc acagttacct cagaagccct aactgtggct gccgcgcac 29160
ctctaattgg cgcgggcaac acactacca tgcaatcaca ggcgccgcta accgtgcacg 29220
actccaaact tagcattggc acccaaggac ccctcacagt gtcagaagg aagctagccc 29280
tgcaaacatc agggccctc accaccacc atagcagtag ccttactatc actgcctcac 29340
ccctctaacc tactgccact ggtagcctgg gcattgactt gaaagagccc atttatacac 29400
aaaaatgaaa actaggacta agtacgggg ctcttttgca tgtaacagac gacctaaaca 29460
ctttgaccgt agcaactggg ccaggtgtga ctattaataa tacttcttg caaactaaag 29520
ttactggagc cttgggtttt gattcacaag gcaatatgca acttaatgta gcaggaggac 29580
taaggattga ttctcaaaac agacgcctta tacttgatgt tagttatccg tttgatgctc 29640
aaaaccaact aaatctaaga ctaggacagg gccctctttt tataaactca gcccaact 29700
tggatattaa ctacaacaaa ggcctttact tgtttacagc ttcaaaact tccaaaaagc 29760
ttgaggttaa cctaagcact gccaaagggt tgatgtttga cgctacagcc atagccatta 29820
atgcaggaga tgggcttgaa tttggttcac ctaatgcacc aaacacaaat cccctcaaaa 29880
caaaaattgg ccatggccta gaatttgatt caaacaaggc tatggttctt aaactaggaa 29940
ctggccttag ttttgacagc acaggtgcca ttacagtagg aaacaaaaat aatgataagc 30000
taactttgtg gaccacacca gctccatctc ctaactgtag actaaatgca gagaaagatg 30060
ctaaactcac tttggtctta acaaaatgtg gcagtaaat acttgctaca gtttcagttt 30120
tggctgttaa aggcagtttg gctccaatat ctggaacagt tcaaagtgt catcttatta 30180
taagatttga cgaaaatgga gtgtactaa acaattcctt cctggaccca gaatttgga 30240
actttagaaa tggagatctt actgaaggca cagcctatac aaacgctgtt ggatttatgc 30300
ctaacctatc agcttatcca aaatctcacg gtaaaactgc caaaagtaac attgtcagtc 30360
aagtttactt aaacggagac aaaactaaac ctgtaacact aaccattaca ctaaacggta 30420
cacaggaaac agggagacaca actccaagtg catactctat gtcattttca tgggactggt 30480
ctggccacaa ctacattaat gaaatatttg ccacatctc ttacactttt tcatacattg 30540
ccaagaata aagaatcgtt tgtgttatgt ttcaacgtgt ttatttttca attgcagaaa 30600
atttcaagtc atttttcatt cagtagtata gccccaccac cacatagctt atacagatca 30660
ccgtacctta atcaaaactca cagaacctta gtattcaacc tgccacctcc ctcccaacac 30720
acagagtaca cagtcctttc tccccggctg gccttaaaaa gcatcatatc atgggtaaca 30780
gacatattct tagtggttat attccacacg gtttctgtc gagccaaacg ctcatcagtg 30840
atattaataa actccccggg cagctcactt aagttcatgt cgctgtccag ctgctgagcc 30900
acaggctgct gtccaacttg cggttgctta acggcgccgc aaggagaagt ccacgcctac 30960
atggggtag agtcataatc gtgcatcagg atagggcggt ggtgctgcag cagcgcgcga 31020
ataaactgct gccgcgcgc cccgtcctc caggaataca acatggcagt ggtctcctca 31080
gcgatgattc gcaccgccc cagcataagg cgcctgttc tccgggcaca gcagcgcacc 31140
ctgatctcac ttaaatcagc acagtaactg cagcacagca ccacaatatt gttcaaaatc 31200
ccacagtga aggcgctgta tccaaagctc atggcgggga ccacagaacc cagtgggcca 31260
tcataccaca agcgaggtta gattaagtgg cgaccctca taaacacgct ggacataaac 31320
attacctctt ttggcatgtt gtaattcacc acctcccggt accatataaa cctctgatta 31380
aacatggcgc catccaccac catcctaaac cagctggcca aaacctgcc gccggtata 31440
cactgcaggg aaccgggact ggaacaatga cagtgagag cccaggactc gtaacctagg 31500
atcatcatgc tcgtcatgat atcaatgttg gcacaacaca ggcacacgtg catacacttc 31560
ctcaggatta caagctcctc ccgcgttaga accatatccc agggaacaac ccattcctga 31620
atcagcgtaa atcccacact gcagggaaga cctcgacgt aactcacgtt gtgcattgtc 31680
aaagtgttac attcgggcag cagcgatga tcctccagta tggtagcgcg ggtttctgtc 31740
tcaaaaggag gtacagcatc cctactgtac ggagtgcgc gagacaaccg agatcgtgtt 31800
ggtcgtagt tgatgccaaa tggaaacgg gacgtagtca tatttctga agcaaaaacca 31860
ggtgcgggcg tgacaaacag atctgcgtct ccggtctcgc cgcttagatc gctctgtgta 31920
gtagtgttag tatatccact ctctcaagc atccaggcgc cccctggctt cgggttctat 31980
gtaaactcct tcatgcgcgc ctgcccgtgat aacatccacc accgcagaat aagccacacc 32040
cagccaacct acacattcgt tctgcgagtc acacacggga ggagcggga gagctggaag 32100
aacctgttt ttttttttat tccaaaagat tatccaaaac ctcaaatga agatctatta 32160
agtgaacgcg ctcccctccg gtggcgtggt caaactctac agccaaagaa cagataatgg 32220
catttgtaag atgtgcaca atggcttcca aaaggcaaac ggccctcacg tccaagtga 32280
cgtaaggct aaaccttca ggtgtaatct cctctataaa cattccagca ccttcaacca 32340
tgcccaata attctcatc cgccaccttc tcaatatatc tctaagcaaa tcccgaaat 32400
taagtccgc cattgtaaaa atctgctcca gagcgcctc caccttcagc ctcaagcagc 32460
gaatcatgat tgcaaaaatt caggttctc acagacctg ataagattca aaagcggaa 32520


```

attaacaaaa ataccgcgat cccgtaggtc ccttcgcagg gccagctgaa cataatcgtg 32580
caggtctgca cggaccagcg cgccacttc ccgcccagga accttgacaa aagaaccac 32640
actgattatg acacgcatac tcggagctat gctaaccagc gtagcccca tgtaagcttt 32700
gttgcatggg cggcgatata aaatgcaagg tgctgctcaa aaaatcaggc aaagcctcgc 32760
gcaaaaaaga aagcacatcg tagtcatgct catgcagata aaggcaggta agctccggaa 32820
ccaccacaga aaaagacacc atttttctct caaacatgtc tgccgggttc tgcataaaca 32880
caaaataaaa taacaaaaaa acatttaaac attagaagcc tgtcttaca caggaaaaac 32940
aaccccttata agcataagac ggactacggc catgccggcg tgaccgtaaa aaaactggtc 33000
accgtgatta aaaagcacca ccgacagctc ctccggtcatg tccggagtca taatgtaaga 33060
ctcgtgtaaac acatcaggtt gattcatcgg tcagtgtctaa aaagcgaccg aaatagcccc 33120
ggggaatata taccgcagcg cgtagagaca acattacagc ccccatagga ggtataacaa 33180
aattaatagg agagaaaaaa acataaacac ctgaaaaacc ctccgtccta ggcaaaatag 33240
caccctcccg ctccagaaca acatacagcg ctccacagcg gcagcctaac agtcagcctt 33300
accagtaaaa aagaaaaacct attaaaaaaa caccactcga caccggacca gctcaatcag 33360
tcacagtgtg aaaaagggcc aagtgcagag cgagtatata taggactaaa aaatgacgta 33420
acgggttaag tccacaaaaa acaccagaa aaccgcagcg gaacctacgc ccagaaacga 33480
aagccaaaaa acccacaact tcctcaaatc gtcacttccg ttttcccacg ttacgtaact 33540
tcccatttta agaaaaactac aattcccaac acatacaagt tactccgccc taaaacctac 33600
gtcaccgcgc ccggttccac gccccgcgcg acgtcacaaa ctccaccccc tcattatcat 33660
attggtctta atccaaaaata aggtatatta ttgatgatg 33699

```

<210> 4

<211> 34448

<212> DNA

<213> Adenovirus subgroup C

<400> 4

```

catcatcaat aatatacctt attttgatt gaagccaata tgataatgag ggggtggagt 60
ttgtgacgtg gcgcggggcg tgggaacggg gcgggtgacg tagtagtgtg gcggaagtgt 120
gatgttgcaa gtgtggcgga acacatgtaa gcgacggatg tggcaaaagt gacgtttttg 180
gtgtgcgccg gtgtacacag gaagtacaaa ttttcgcgcg gtttttagcg gatgtgttag 240
taaatttggg cgtaaccgag taagatttgg ccattttcgc gggaaaaactg aataagagga 300
agtgaatctt gaataatttt gtgttactca tagcgcgtaa tatttgtcta gggcccgggg 360
gactttgacc gtttacgtgg agactcgccc aggtgttttt ctccaggtgtt ttccgcgttc 420
cggggtcaag ttggcgtttt attattatag tcagctgacg ttagtagtat ttatacccg 480
tgagttcctc aagaggccac tcttgagtgc cagcgagtag agttttctcc tccgagccgc 540
tccgacaccc ggactgaaaa tgagacatat tatctgccac ggaggtgtta ttaccgaaga 600
aatggccgca agtcttttgg accagctgat cgaagaggta ctggctgata atcttccacc 660
tcctagccat tttgaaccac ctacccttca cgaactgtat gatttagacg tgacggcccc 720
cgaagatccc aacgaggagg cggtttcgca gatttttccc gactctgtaa tgttggcggt 780
gcaggaaggg attgacttac tcacttttcc gccggcgccc ggttctccgg agccgcctca 840
cctttcccgg cagccccgag agccggagca gagagccttg ggtccggttt ctatgccaaa 900
ccttgtaccg gaggtgatcg atcttacctg ccacgaggct ggctttccac ccagtgcaga 960
cgaggatgaa gagggtaggg agtttgtgtt agattatgtg gagcaccctg ggcacggtt 1020
caggtcttgt cattatcac ggaggaatac gggggaccca gatattatgt gttcgctttg 1080
ctatatgagg acctgtggca tgtttgtcta cagtaagtga aaattatggg cagtggttga 1140
tagagtgggt gggttgggtt ggtaattttt tttttaattt ttacagtttt gtggtttaaa 1200
gaattttgta ttgtgatttt tttaaaaggt cctgtgtctg aacctgagcc tgagccccgag 1260
ccagaaccgg agcctgcaag acctaccgcg cgtcctaaaa tggcgccctg taccctgaga 1320
cgccccgacat cacctgtgtc tagagaatgc aatagtagta cggatagctg tgactccggt 1380
ccttctaaca cacctcctga gatacacccg gtggtcccgc tgtgccccat taaaccagtt 1440
gccgtgagag ttggtggggc tcgccaggct gtggaatgta tcgaggactt gcttaacgag 1500
cctgggcaac ctttgactt gagctgtaaa cggcccaggc cataaggtgt aaacctgtga 1560
ttgcgtgtgt ggttaacgca tttgtttgct gaatgagttg atgtaagttt aataaagggt 1620
gagataatgt ttaacttgca tggcggttta aatggggcgg ggcttaagg gtatataatg 1680
cgccgtgggc taatcttgtt tacatctgac ctcatggagg ctggggagtg tttggaagat 1740
ttttctgctg tgcgtaactt gctggaacag agctctaaca gtacctctg gttttggagg 1800
tttctgtggg gctcatccca ggcaaatgta gtctgcagaa ttaaggagga ttacaagtgg 1860
gaatttgaag agcttttgaa atcctgtggt gagctgtttg attctttgaa tctgggtcac 1920
caggcgcttt tccaagagaa ggtcatcaag actttggatt tttccacacc ggggcgcgct 1980
gcggctgctg ttgctttttt gagttttata aaggataaat ggagcgaaga aacctatctg 2040
agcggggggg acctgtgga ttttctggcc atgcatctgt ggagagcggt tgtgagacac 2100
aagaatcgcc tgctactgtt gtcttccgct cgcccgcgga taataccgac ggaggagcag 2160
cagcagcagc aggaggaagc caggcgcgcg cgccagagc agagcccatg gaaccgaga 2220
gcccgcctgg accctcgga atgaatgtt tacaggtggc tgaactgtat ccagaactga 2280
gacgcatttt gacaattaca gaggatgggc aggggctaaa gggggtaaaag agggagcggt 2340

```

```

gggcttgatga ggctacagag gaggctagga atctagcttt tagcttaatg accagacacc 2400
gtcctgagtg tattactttt caacagatca aggataatg cgctaagtga cttgatctgc 2460
tggcgagagaa gtattccata gagcagctga ccacttactg gctgcagcca ggggatgatt 2520
ttgaggagggc tattagggtat tatgcaaagg tggcacttag gccagattgc aagtacaaga 2580
tcagcaaaact tgtaaatatc aggaattgtt gctacatttc tgggaacggg gccgaggtgg 2640
agatagatac ggaggatagg gtggccttta gatgtagcat gataaatatg tggccggggg 2700
tgcttggcat ggacgggggtg gttattatga atgtaagggt tactggcccc aattttagcg 2760
gtacgggtttt cctggccaat accaacctta tcctacacgg tgtaagcttc tatgggttta 2820
acaatacctg tgtggaagcc tggaccgatg taagggttcg gggctgtgccc ttttactgct 2880
gctggaaggg ggtggtgtgt cgccccaaaa gcagggtctc aattaagaaa tgcctctttg 2940
aaagggtgac cttgggtatc ctgtctgagg gtaactccag ggtgcgccac aatgtggcct 3000
ccgactgtgg ttgcttcacg ctagtgaata gcgtggctgt gattaagcat aacatggtat 3060
gtggcaactg cgaggacagg gcctctcaga tgcctgacctg ctccgacggc aactgtcacc 3120
tgctgaagac cattcacgta gccagccact ctccgaaggc ctggccagtg tttgagcata 3180
acatactgac ccgctgttcc ttgcatttgg gtaacaggag gggggtgttc ctaccttacc 3240
aatgcaattt gagtcaactt aagatattgc ttgagccgga gacatgttcc aaggtgaacc 3300
tgaacggggt gtttgacatg accatgaaga tctggaagg gctgaggtac gatgagacc 3360
gcaccagggtg cagaccctgc gagtgtggcg gtaaacatat taggaaccag cctgtgatgc 3420
tggatgtgac cgaggagctg agggccgatc acttgggtgt ggcctgcacc cgcgctgagt 3480
ttggctctag cgatgaagat acagattgag gtactgaaat gtgtggcggt ggcttaagg 3540
tgggaaagaa tatataagg gggggtctta tctagtcttt tatctgtttt gcagcagccg 3600
ccgcccgcct gaggaccaac tcgtttgatg gaagcattgt gactctatat ttgacaacgc 3660
gcatgccccc atggggccggg gtgcgtcaga atgtgatggg ctccagcatt gatggtcgcc 3720
ccgtcctgccc cgcaactctt actaccttga cctacgagac cgtgtctgga acgcccgttg 3780
agactgcagc ctccgcccgc gcttcagccg ctgcagccac cgcccgcggg atttgtgact 3840
actttgcttt cctgagcccg cttgcaagca gtgcagcttc ccgttcatcc gcccgcgatg 3900
acaagttgac ggtctctttt gcacaattgg attctttgac ccgggaactt aatgtcgttt 3960
ctcagcagct gttggtatcg cgccagcagg ttcttgcctt gaaggcttcc tccccccca 4020
atgcggttta aaacataaat aaaaaaccag actctgtttg gatttggatc aagcaagtgt 4080
cttgctgtct ttttttaggg gttttgcgcg cgcggtaggc ccgggaccag cggctctcgt 4140
cgttgagggg cctgtgtatt ttttccagga cgtggttaa gtagctctgg atgttcagat 4200
acatgggcat aagcccgctt ctggggtgga gtagcacca ctgcagagct tcatgtcgg 4260
gggtggtgtt gtagatgac cagtcgtagc aggagcgctg ggcgtgtgtc ctaaaaatgt 4320
ctttcagtag caagctgatt gccaggggca ggcccttgg gtaagtgttt acaaagcggt 4380
taagctggga tgggtgcata cgtggggata tgagatgcat cttggactgt atttttaggt 4440
tggtatggtt cccagccata tccctccggg gattcatgtt gtgcagaacc accagcacag 4500
tgtatccggt gcacttgga aatttgcatt gtagcttaga aggaaatgcg tggaaagact 4560
tggagacgcc cttgtgacct ccaagatttt ccatgcattc gtccataatg atggcaatgg 4620
gcccacgggc ggcggcctgg gcgaagatat ttctgggac actaacgtca tagtttgttt 4680
ccaggtatgag atcgtcatag gccattttta caaagcgcg gcgagggggt ccagactgag 4740
gtataatggt tccatccggc ccaggggcgt agttaccctc acagatttgc atttccacg 4800
ctttgagttc agatgggggg atcatgtcta cctgcggggc gatgaagaaa acggtttccg 4860
gggtagggga gatcagctgg gaagaaagca ggttcctgag cagctgcgac ttaccgcagc 4920
cggtggggcc gtaaatcaca cctattaccg ggtgcaactg gtagttaaga gagctgcagc 4980
tgccgtcatc cctgagcagg ggggccactt cgtaagcat gtccctgact cgcatgtttt 5040
ccctgaccaa atccgcaga aggcgctcgc cgccagcga tagcagttct tgcagggaag 5100
caaagttttt caacggtttg agaccgtccg ccgtaggcat gcttttgagc gtttgaccaa 5160
gcagttccag gcggtcccac agctcgggca cctgctctac ggcattctga tccagcatat 5220
ctcctcggtt cgcgggttgg ggcggcttcc gctgtacggc agtagtcggt gctcgtccag 5280
acgggcccagg gtcattgtct tccacggcg cagggtcctc gtcagcgtag tctgggtcac 5340
ggtagagggg tgcgctcccg gctgcgcgtt ggccagggtg cgcttgaggc tggctcgtct 5400
gggtgctgaag cgctgcgggt cttcgccctg cgcgtcgggc aggtagcatt tgaccatggt 5460
gtcatagtcc agccccctcg cggcgtggcc cttggcgcg agcttgccct tggaggaggc 5520
gccgcacgag gggcagtga gacttttgag ggcgtagagc ttgggcgcga gaaataccga 5580
ttccggggag taggcacccg cgccgcaggc cccgcagacg gtctcgcat ccacgagcca 5640
ggtgagctct ggccgttcgg ggtcaaaaac caggtttccc ccatgctttt tgatgcgttt 5700
cttacctctg gtttccatga gccggtgtcc acgctcgggt acgaaaaggc tgtccgtgtc 5760
cccgtataca gacttgagag gcctgtcctc gagcggtgtt ccgcggtcct cctcgtatag 5820
aaactcggac cactctgaga caaaggctcg cgtccagggc agcacgaagg aggttaagt 5880
ggaggggtag cggctggtgt ccactagggg gtccactcgc tccagggtgt gaagacacat 5940
gtcgccctct tcggcatcaa ggaagggtat tggttttag gtgtaggcca cgtgaccggg 6000
tgttcctgaa ggggggctat aaaagggggt gggggcgcg tgcctctcac tctcttccgc 6060
atcgctgtct gcgagggcca gctgttgggg tgaactactc ctctgaaaag cgggcatgac 6120
ttctgcgcta agattgtcag tttccaaaaa cgaggaggat ttgatattca cctggccgcg 6180
ggtgatgcct ttgagggtgg ccgcatccat ctggtcagaa aagacaatct tttgtgtgtc 6240
aagcttggtg gcaaacgacc cgtagagggc gttggacagc aacttgcgca tggagcgagc 6300

```

ggtttggttt ttgtcgcgat cggcgcgctc cttggccgcg atgttttagct gcacgtattc 6360
gcgcgcaacg caccgcatt cgggaaagac ggtggtgccc tcgtcgggca ccagggtcac 6420
gcgccaaaccg cgggttggtca ggtgacaag gtcaacgcg gtggctacct ctccgcgtag 6480
gcgctcgttg gtccagcaga ggcggccgccc cttgcgcgag cagaatggcg gttaggggtc 6540
tagctgcgtc tcgtccgggg ggtctgcgtc caccggtaaag accccgggca gcaggcgcg 6600
gtcgaagtag tctatcttgc atccttgcaa gtctagcgc tcgtgccatg cgcgggcggc 6660
aagcgcgcgc tcgtatgggt tgagtggggg accccatggc atgggggtgg tgagcgcgga 6720
ggcgtacatg ccgcaaatgt cgtaaacgta gaggggctct ctgagtattc caagatatgt 6780
agggtagcat cttccaccgc ggtgctggc gcgcacgtaa tcgtatagtt cgtgcgaggg 6840
agcaggaggg tcgggaccga ggttgctacg ggcgggctgc tctgctcggg agactatctg 6900
cctgaagatg gcatgtgagt tggatgatat ggttggacgc tggaaagcgt tgaagctggc 6960
gtctgtgaga cctaccgcgt cagcgacgaa ggaggcgtag gagtgcgcga gcttgttgac 7020
cagctcggcg gtgacctgca cgtctagggc gcagtagtcc agggtttctt tgatgatgtc 7080
atacttatcc tgtccctttt tttccacag ctgcgggttg aggacaaact cttcgcggtc 7140
tttccagtac tcttgatcg gaaacccgtc ggcctccgaa cggtaagagc ctagcatgtg 7200
gaactggttg acgacctggg agcgcgacga tcccttttct acgggttagcg cgtatgcctg 7260
cggcgccctc cggagcgagg tgtgggtgag cgcaaagggtg tccctgacca tgactttgag 7320
gtactggtat ttgaagtcag tgtcgtcgca tccgccctgc tcccagagca aaaagtcctg 7380
gcgctttttg gaacgcggat ttggcagggc gaagggtgaca tcgttgaaga gtatctttcc 7440
cgcgcgaggc ataaagttgc gtgtgatgcg gaagggtccc ggcacctcgg aacgggttgt 7500
aattacctgg gcggcgagca cgtatctgct aaagccgttg atgttgtggc ccacaatgta 7560
aagttccaag aagcgcggga tgccttgat ggaaggcaat tttttaagt cctcgtaggt 7620
gagctcttca ggggagctga gccctgtgct tgaaggggcc cagtctgcaa gatgagggtt 7680
ggaagcgacg aatgagctcc acaggtcacg ggcattagc atttgcaggt ggtcgcgaaa 7740
ggtcctaacc tgccgacctt tgccatttt tctgggggtg atgcagtaga aggtaaagcg 7800
gtcttgttcc cagcgggtccc atccaagggt cgcggttagg tctcgcgcg cagtcactag 7860
aggctcatct ccgccgaact tcatgaccag catgaagggc acgagctgct tcccaaaggc 7920
ccccatccaa gtataggtct ctacatcgta ggtgacaaa agacgctcgg tgcgaggatg 7980
cgagccgatc ggaagaact ggtctcccgc ccaccaattg gaggagtggc tattgatgtg 8040
gtgaaaagtag aagtcctgac gacgggcccga aactcgtgc tggcttttgt aaaaacgtgc 8100
gcagtagctg cagcgggtgca cgggctgtac atcctgcacg aggttgacct gacgaccgcg 8160
cacaaggaaag cagagtgagg atttgagccc ctgcctggc gggtttggtt ggtggtcttc 8220
tacttcggct gctgtcctt gacgctctgg ctgctcgagg ggaattacg tgagtcggac 8280
caccacgccc gcgagccca aagtcagat gtccgcgcgc ggcggtcggg gcttgatgac 8340
aacatcgcg agatgggagc tgtccatggt ctggagctcc cgcggcgta ggtcaggcgg 8400
gagctcctgc aggtttacct cgcatagacg ggtcaggggc cgggctagat ccagggtgta 8460
cctaatttcc aggggctggg tgggtggcgc gtcgatggct tgcaagaggc cgcacccccg 8520
cggcgcgact acggtaaccg cggcggggcg gttggccgcg ggggtgtcct tggatgatgc 8580
atctaaaagc ggtgacgcg gcgagcccc ggaggtaggg ggggctccg acccgccggg 8640
agagggggca ggggcacgct ggcgcgcgc gcgggcagga gctggtgctg cgcgcgtagg 8700
ttgctggcga acgcgacgac gcggcggttg atctcctgaa tctggcgcc ctgctgtagg 8760
acgacggccc cgttgagctt gacgctgaaa gagagttcga cagaatcaat ttcggtgtcg 8820
ttgacggcgg cctggcgcaa aatctcctgc acgtctcctg agttgtcttg ataggcgatc 8880
tcggccatga actgctcgat ctcttctctc tggagatctc cgcgtccggc tcgctccacg 8940
gtggcgcgga ggtcgttgga aatgggggccc atgagctgcg agaaggcgtt gaggcctccc 9000
tcgttccaga cgcggctgta caccacgccc ccttcggcat cgcgggcgcg catgaccacc 9060
tgccgagat tgagctccac gtccggggcg aagacggcgt agtttcgcag gcgctgaaag 9120
aggtagttga ggggtgtggc ggtgtgttct gccacgaaga agtacataac ccagcgtcgc 9180
aacgtggatt cgttgatatc ccccaaggcc tcaaggcgct ccatggcctc gtagaagtc 9240
acggcggaagt tgaaaaaactg ggaagtgcgc gccgacacgg ttaactcctc ctccagaaga 9300
cggatgagct cggcgacagt tcgcgcacac aggtctacag ggcctcttct 9360
tcttcttcaa tctcctcttc cataagggcc tccccttctt cttcttctg cggcggtggg 9420
ggagggggga cagggcgcg acgacggcg accgggaggc ggtcgacaaa gcgctcgatc 9480
atctccccgc ggcgacggcg catggtctcg gtgacggcg ggcggtctc gcgggggcgc 9540
agttggaaga cgcgccccgt catgtcccgg ttatgggttg gcggggggct gccatgcggc 9600
agggatacgg cgtaacgat gcatctcaac aattgttgtg taggtactcc gccgcccagg 9660
gacctgagcg agtccgcatc gaccggatcg gaaaacctct cgagaaaggc gtctaaccag 9720
tcacagtcgc aaggtaggct gagcaccgtg gcggggcgca gcggggcgcg gtcgggggtg 9780
tttctggcgg aggtgctgct gatgatgtaa ttaaagtag cggtcttgag acggcgagatg 9840
gtcgacagaa gccatgtc cttgggtccg gctgctgaa tgcgcaggcg gtcggccatg 9900
ccccaggctt cgttttgaca tcggcgagg tcttgtagt agtctgcat gagcctttct 9960
accggcactt cttcttctcc ttcctcttgt cctgcatctc ttgcatctat cgctcgggcg 10020
gcggcgaggt ttggcgtag gtggcgccct cttcctccca tgcgtgtgac cccgaagccc 10080
ctcatcgct gaagcaggc taggtcggcg acaacgcgct cggctaatat ggcctgctgc 10140
acctcgctga gggtagactg gaagtcaccc atgtccacaa agcgggtgga tgcgcccgtg 10200
ttgatggtgt aagtgcagtt ggcataacg gaccagttaa cggctctggtg acccggtgc 10260

gagagctcgg	tgtacctgag	acgcgagtaa	gccctcagag	caaatacgta	gtcgttgcaa	10320
gtccgcacca	ggtactggta	tcccacaaaa	aagtgcggcg	gcggctggcg	gtagaggggc	10380
cagcgtagg	tggccggggc	tccggggggc	agatcttcca	acataaggcg	atgatatccg	10440
tagatgtacc	tggacatcca	ggtgatgccg	gcggcggttg	tggagcgcg	cggaaggctg	10500
cggacgcggt	tccagatggt	gcgcagcgcg	aaaaagtgct	ccatggctcg	gacgctcttg	10560
ccggtcaggc	gcgcgcaatc	gttgacgctc	tagaccgtgc	aaaaggagag	cctgtaagcg	10620
ggcactcttc	cggtggtctg	tggataaatt	cgcaagggta	tcatggcgga	cgaccggggt	10680
tcgagccccg	tatccggccg	tccgcccgtg	tccatgcggt	taccgcccgc	gtgtcgaacc	10740
cagggtgtgc	acgtcagaca	acgggggag	gtcctctttg	gcttccttcc	aggcgcggcg	10800
gctgtgcgc	tagctttttt	ggccactggc	cgcgcgagc	gtaagcggtt	aggctggaaa	10860
gcgaagcat	taagtggctc	gtccctgta	gccggagggt	tattttccaa	gggttgagtc	10920
gcgggacccc	cggttcgagt	ctcggaccgg	ccggactgcg	gcgaacgggg	gtttgcctcc	10980
ccgtcatgca	agaccccgct	tgcaaatccc	tccggaacaa	gggacgagcc	ccttttttgc	11040
ttttcccaga	tgcattccgg	gctgcggcag	atgcgcccc	ctcctcagca	gcggcaagag	11100
caagagcag	ggcagacatg	cagggcaccc	tcccctcctc	ctaccgcgtc	aggaggggcg	11160
acatccggg	ttgacgcggc	agcagatggt	gattacgaac	ccccgcggcg	ccggggcccg	11220
cactacctgg	acttgaggga	gggcgagggc	ctggcgcggc	taggagcgcc	ctctcctgag	11280
cggtaaccac	gggtgcagct	gaagcgtgat	acgcgtgagg	cgtacgtgcc	gcggcagaac	11340
ctgtttcgcg	accgcgaggg	agaggagccc	gaggagatgc	gggatcgaaa	gttccacgca	11400
gggcgcgagc	tgccgcatgg	cctgaatcgc	gagcggttgc	tgccgcgagga	ggactttgag	11460
cccgcgcgcg	gaaccgggat	tagtcccgcg	cgcgcacacg	tggcgccgcg	cgacctggta	11520
accgcatacg	agcagacggt	gaaccaggag	attaactttc	aaaaaagctt	taacaaccac	11580
gtgcgtacgc	ttgtggcgcg	caggagggtg	gctataggac	tgatgcatct	gtgggacttt	11640
gtaagcgagc	tggagcaaaa	cccaaatagc	aagccgctca	tggcgagct	gttcttata	11700
gtgcagcaca	gcagggacaa	cgaggcattc	agggatgcgc	tgctaatacat	agtagagccc	11760
gagggccgct	ggctgctcga	tttgataaac	atcctgcaga	gcatagtggt	gcaggagcgc	11820
agcttgagcc	tggctgacaa	ggtggccgcg	atcaactatt	ccatgcttag	cctgggcaag	11880
ttttacgccc	gcaagatata	ccatacccct	tacgttccca	tagacaagga	ggtaaaagtc	11940
gaggggttct	acatgcgcat	ggcgctgaag	gtgcttacct	tgagcgacga	cctgggcgtt	12000
tatcgcaacg	agcgcatcca	caaggccgtg	agcgtgagcc	ggcggcgcga	gctcagcgac	12060
cgcgagctga	tgcacagcct	gcaaaaggcc	ctggctggca	cgggcagcgg	cgatagagag	12120
gccgagtcct	actttgacgc	gggcgctgac	ctgcgctggg	ccccaaagcc	acgcgcctct	12180
gagcgagctg	gggcccggac	tgggctggcg	gtggcacccg	cgcgcgctgg	caacgtcggc	12240
ggcggtggag	aatatgacga	ggacgatgag	tacgagccag	aggacggcga	gtactaagcg	12300
gtgatgtttc	tgatcagatg	atgcaagacg	caacggaccc	ggcggtgcgg	gcggcgctgc	12360
agagccagcc	gtccggcctt	aactccacgg	acgactggcg	ccaggctcatg	gaccgcatca	12420
tgtcgctgac	tgccgcgaat	cctgacgcgt	tccggcagca	gccgcaggcc	aaccgctctt	12480
ccgcaattct	ggaagcgggt	gtcccggcgc	gcgcaaaccc	cacgcacgag	aagggtgctg	12540
cgatcgtaaa	cgcgctggcc	gaaaaacagg	ccatccggcc	cgacgaggcc	ggcctggtct	12600
acgacgcgct	gcttcagcgc	gtggctcggt	acaacagcgg	caactgagag	accaacctgg	12660
accggctggt	gggggatgtg	cgcgaggccg	tggcgagcgg	tgagcgcgcg	cagcagcagc	12720
gcaacctggg	ctccatgggt	gcactaaacg	ccttctctgag	tacacagccc	gccaacgtgc	12780
cgcggggaca	ggaggactac	accaactttg	tgagcgcact	gcggctaata	gtgactgaga	12840
caccgcaaa	tgaggtgtac	cagtctgggc	cagactatct	tttccagacc	agtagacaag	12900
gcctgcagac	cgtaaacctg	agccaggctt	tcaaaaactt	gcaggggctg	tgggggggtg	12960
gggctccacc	aggcgaccgc	cgacccgtgt	ctagcttgct	gacgcccac	tcgcgctgt	13020
tgctgctgct	aatagcggcc	ttcacggaca	gtggcagcgt	gtcccgggac	acatacctag	13080
gtcacttgct	gacactgtac	cgcgaggcca	taggtcaggc	gcattgtggac	gagcatactt	13140
tccaggagat	tacaagtgtc	agccgcgcgc	tggggcagga	ggacacgggc	agcctggagg	13200
caaccctaaa	ctacctgctg	accaaccggc	ggcagaagat	cccctcggtg	cacagttaa	13260
acagcgagga	ggagcgcatt	ttgcgctacg	tgacgacag	cgtgagcctt	aacctgatgc	13320
gcgacgggg	aacgcccagc	gtggcgctgg	acatgaccgc	gcgcaacatg	gaaccgggca	13380
tgtatgcctc	aaaccggccg	tttatcaacc	gcctaattga	ctacttgcat	cgcgcgccg	13440
ccgtgaaccc	cgagtatttc	accaatgcca	tcttgaaccc	gcactggcta	ccgcccctg	13500
gtttctacac	cgggggattc	gaggtgcccc	agggtaacga	tggattcctc	tgggacgaca	13560
tagacgacag	cgtgttttcc	ccgcaaccgc	agaccctgct	agagttgcaa	cagcgcgagc	13620
aggcagaggc	ggcgctgcga	aaggaaagct	tccgcaggcc	aagcagcttg	tccgatctag	13680
cgctgcgggc	cccgcggcta	cgtgctagta	gccattttcc	aagcttgata	gggtctctta	13740
ccagcactcg	caccaccgcg	cgcgccctgc	tggcgagga	ggagtaccta	aacaactcgc	13800
tgctgcagcc	gcagcgcgaa	aaaaaacctgc	ctccggcatt	tcccaacaac	gggatagaga	13860
gcctagtggg	caagatgagt	agatggaaga	cgtacgcgca	ggagcacagg	gacgtgccag	13920
gcccgcgccc	gcccaccgct	cgtcaaaagg	acgaccgtca	gcggggctctg	gtgtgggagg	13980
acgatgactc	ggcagacgac	agcagcgtcc	tggattttgg	agggagtggc	aaccgcttgc	14040
cgacacctcg	cccagggtcg	gggagaatgt	tttaaaaaaa	aaaaagcatg	atgcaaaata	14100
aaaaactcac	caaggccatg	gcaccgagcg	ttggttttct	tgtattcccc	ttagtatgcg	14160
gcgcgcggcg	atgtatgagg	aaggtcctcc	tccctcctac	gagagtgtgg	tgagcgcggc	14220

```

gccagtggcg gcggcgctgg gttctccctt cgatgctccc ctggaccgcg cgtttgtgcc 14280
tccgcggtac ctgcggccta cgggggggag aaacagcate cgttactctg agttggcacc 14340
cctattcgac accaccctgt tgtacctggt ggacaacaag tcaacggatg tggcatccct 14400
gaactaccag aacgaccaca gcaactttct gaccacggtc attcaaaaca atgactacag 14460
cccgggggag gcaagcacac agaccatcaa tcttgacgac cggtcgcact ggggcggcga 14520
cctgaaaacc atcctgcata ccaacatgcc aaatgtgaac gagtcatgtt ttaccaataa 14580
gtttaaggcg cgggtgatgg tgctcgctt gcctactaag gacaatcagg tggagctgaa 14640
atacgagtgg gtggagtcca cgctgcccga gggcaactac tccgagacca tgaccataga 14700
ccttatgaac aacgcgatcg tggagcacta cttgaaagtg ggcagacaga acggggttct 14760
ggaaagcgac atcggggtaa agtttgacac ccgcaacttc agactggggt ttgaccccgt 14820
cactggtctt gtcatgcctg gggatatata aaacgaagcc ttccatccag acatcathtt 14880
gctgccagga tgccgggtgg acttcaccca cagccgctg agcaacttgt tggcgtccg 14940
caagcggcaa cccttccagg agggctttag gatcacctac gatgatctgg aggggtggtaa 15000
cattcccgca ctggtggatg tggacgccta ccaggcgagc ttgaaagatg acaccgaaca 15060
gggcgggggt ggcgcaggcg gcagcaacag cagtggcagc ggcgcggaag agaactccaa 15120
cgcggaatgc gcggcaatgc agccggtgga ggacatgaac gatcatgcca ttcgcgcgca 15180
cacctttgcc acacgggctg aggagaagcg cgctgaggcc gaagcagcgg ccgaagctgc 15240
cgccccgct gcgcaacccg aggtcgagaa gcctcagaag aaaccgggtg tcaaacccct 15300
gacagaggac agcaagaaac gcagtataca cctaataagc aatgacagca ccttcaccca 15360
gtaccgcagc tggtagcttg catacaacta cggcgaccct cagaccgga tccgctcagt 15420
gacctgctt tgactcctg acgtaacctg cggctcggag caggctctact ggtcgttgcc 15480
agacatgatg caagaccccg tgaccttccg ctccacgcgc cagatcagca actttccggt 15540
ggtggcgccc gagctgttgc ccgtgcactc caagagcttc tacaacgacc aggccgtcta 15600
ctcccaactc atccgccagt ttacctctct gaccacgtg ttcaatcgct ttcccgagaa 15660
ccagattttg gcgcgcocgc cagcccccac catcaccacc gtcagtgaag acgttctgct 15720
tctcacagat cacgggacgc taccgtcgcg caacagcate ggaggagtcc agcgagtgc 15780
cattactgac gccagacgcc gcacctgccc ctacgtttac aaggccctgg gcatagtctc 15840
gccgcgcgtc ctatcgagcc gcactttttg agcaagcatg tccatcctta tatcgcccag 15900
caataacaca ggctggggcc tgccgttccc aagcaagatg tttggcgggg ccaagaagcg 15960
ctccgaccaa caccagtgcc gcgtgcgcgg gcaactaccg gcgccctggg gcgcgcacaa 16020
acgcggccgc actgggcgca ccaccgtcga tgacgccatc gacgcggtgg tggaggaggc 16080
gcgcaactac acgcccacgc gcgccaccag gtccacagtg gacgcggcca ttcagaccgt 16140
gggtgcggga gcccggcgct atgctaaaat gaagagacgg cggaggcgcg tagcacgtcg 16200
ccaccgcgcg cgaccgggca ctgccgccca acgcgcggcg gcggccctgc ttaaccgcgc 16260
acgtcgcacc ggccgacggg cggccatgcg ggccgctcga aggtggtggc cgggtattgt 16320
cactgtgccc ccaggttcca ggcgacgagc ggcgcggcga gcagccggcg ccattagtgc 16380
tatgactcag ggtcgcaggg gcaacgtgta ttgggtgcgc gactcggtta gcggcctgcg 16440
cgtgccctgt cgaccccgcc ccccgcgcaa ctagattgca agaaaaaact acttagactc 16500
gtactgttgt atgtatccag cggcggcgcc gcgcaacgaa gctatgtcca agcgcaaaat 16560
caaagaagag atgtctccag tcatcgcgcc ggagatctat ggccccccga agaaggaaaga 16620
gcaggattac aagccccgaa agctaaagcg ggtcaaaaag aaaaagaaag atgatgatga 16680
tgaacttgac gacgaggtgg aactgctgca cgctaccgcg ccagggcgac ggttacagtg 16740
gaaaggtcga cgcgtaaaac gtgttttgcg acccggcacc accgtagtct ttacgcccgg 16800
tgagcgctcc acccgcacct acaagcgctg gtatgatgag gtgtacggcg acgaggacct 16860
gcttgagcag gccaacgagc gcctcgggga gtttgcttac ggaaagcggc ataaggacat 16920
gctggcggtg ccgctggacg agggcaaccc aacacctagc ctaaagcccg taacactgca 16980
gcaggtgctg cccgcgcttg caccgtccga agaaaagcgc ggcctaaagc gcgagtctgg 17040
tgacttggca cccaccgtgc agctgatggt acccaagcgc cagcgactgg aagatgtctt 17100
ggaaaaaatg accgtggaac ctgggctgga gcccgagggtc cgcggtcggc caatcaagca 17160
ggtggcgccg ggactgggag tgacagacct ggacgttcag ataccacta ccagtgcac 17220
cagtattgcc accgccacag agggcatgga gacacaaacg tccccggtt cctcagcgtt 17280
ggcggtatgc gcggtgcagg cggctcgtgc ggccgcgtcc aagacctcta cggagggtgca 17340
aacggaccgg tggatgtttc gcgtttcagc ccccgcgccg ccgcgcggtt cgaggaaagta 17400
cggcgccgcc agcgcgctac tgcccgaata tgccctacat ccttccattg cgcctacccc 17460
cggctatcgt ggctacacct aaccgcccag aagacgagca actaccgac gccgaaccac 17520
cactggaacc cgcgcgccgc gtcgcgctcg ccagcccggt ctggccccga tttccgtgcg 17580
cagggtggct cgcgaaggag gcaggacct ggtgctgcca acagcgcgct accaccccag 17640
catcgtttaa aagccggtct ttgtggttct tgcagatatg gccctcaact gccgcctccg 17700
tttcccggtg ccgggatttc gaggaagaat gcaccgtagg aggggcatgg ccggccacgg 17760
cctgacgggc ggcgtgcgtc gtgcgcacca ccggcgcgcg cgcgcgctgc accgtcgcat 17820
gcgcggcggt atcctgcccc tccttattcc actgatcgcc gcggcgattg gcgccgtgcc 17880
cggaattgca tccgtggcct tgacggcgca gagacactga ttaaaaacaa gttgcatgtg 17940
gaaaaatcaa aataaaaagt ctggactctc acgctcgctt ggtcctgtaa ctattttgta 18000
gaattggaag catcaacttt cgtctcttgg ccccgcgaca cggtcgcgcg ccgttcatgg 18060
gaaactggca agatatcggc accagcaata tgagcggtgg cgccttcagc tggggctcgc 18120
tgtggagcgg cattaaaaat ttcggttcca ccgttaagaa ctatggcagc aaggcctgga 18180

```

acagcagcac	aggccagatg	ctgagggata	agttgaaaga	gcaaaatttc	caacaaaagg	18240
tggttagatg	cctggcctct	ggcattagcg	gggtggtgga	cctggccaac	caggcagtg	18300
aaaataagat	taacagtaag	cttgatcccc	gccctcccgt	agaggagcct	ccaccggccg	18360
tgagagacagt	gtctccagag	gggctgtggc	aaaagcgtcc	gcgccccgac	agggaaagaa	18420
ctctggtgac	gcaaatagac	gagcctccct	cgtacgagga	ggcactaaag	caaggcctgc	18480
ccaccaccg	tcccatcgcg	cccatggcta	ccggagtgc	gggccagcac	acaccgtaa	18540
cgctggacct	gcctccccc	gccgacaccc	agcagaaacc	tgtgctgcca	ggcccagacc	18600
ccgttggtgt	aacccgtcct	agccgcgcgt	ccctgcgcgc	cgccgccagc	ggtccgcgat	18660
cggtgcggcc	cgtagccagt	ggcaactggc	aaagcacact	gaacagcatc	gtgggtcttg	18720
gggtgcaatc	cctgaagcgc	cgacgatgct	tctgaatagc	taacgtgtcg	tatgtgtgtc	18780
atgtatgcgt	ccatgtcgcc	gccagaggag	ctgctgagcc	gccgcgcgcc	cgctttccaa	18840
gatggctacc	ccttcgatga	tgccgcagt	gtcttacatg	cacatctcgg	gccaggacgc	18900
ctcggagtac	ctgagccccg	ggctggtgca	gtttgcccgc	gccaccgaga	cgtaacttcag	18960
cctgaataac	aagtttagaa	accccacggt	ggcgccctac	cacgacgtga	ccacagaccg	19020
gtccagcgt	ttgacgtgc	ggttcacccc	tgtggaccgt	gaggatactg	cgtaactcga	19080
caaggcgcgg	ttcaccttag	ctgtgggtga	taaccgtgtg	ctggacatgg	cttccacgta	19140
ctttgacatc	cgcgcgctgc	tggacagggg	ccctactttt	aagccctact	ctggcactgc	19200
ctacaacgcc	ctggctccca	aggggtcccc	aaatccttgc	gaatgggatg	aagctgctac	19260
tgctcttgaa	ataaacctag	aagaagagga	cgatgacaac	gaagacgaag	tagacgagca	19320
agctgagcag	caaaaaactc	acgtatttgg	gcaggcgcc	tattctggta	taaatattac	19380
aaaggagggt	attcaaatag	gtgtcgaagg	tcaaacacct	aaatagccg	ataaaacatt	19440
tcaacctgaa	cctcaaatag	gagaatctca	gtggtacgaa	actgaaatta	atcatgcagc	19500
tgaggagatc	cttaaaaaga	ctaccccaat	gaaacatgt	tacggttcat	atgcaaaacc	19560
cacaaatgaa	aatggagggc	aaggcattct	tgtaaagcaa	caaaatggaa	agctagaaag	19620
tcaagtggaa	atgcaatttt	tctcaactac	tgaggcgacc	gcaggcaatg	gtgataactt	19680
gactcctaaa	gtggtattgt	acagtgaaga	tgtagatata	gaaaccccag	acactcatat	19740
ttcttacatg	cccactatta	aggaaggtaa	ctcacgagaa	ctaattgggc	aacaatctat	19800
gcccacacag	cctaattaca	ttgcttttag	ggacaatttt	attggtctaa	tgtattacaa	19860
cagcacgggt	aatatgggtg	ttctggcggt	ccaagcatcg	cagttgaatg	ctgtttaga	19920
tttgcaagac	agaaacacag	agctttcata	ccagcttttg	cttgattcca	ttggtgatag	19980
aaccaggtag	ttttctatgt	ggaatcaggc	tggtgacagc	tatgatccag	atgttagaat	20040
tattgaaaat	catggaactg	agatgaact	tccaatttac	tgctttccac	tgggaggtgt	20100
gattaataca	gagactctta	ccaaggtaaa	acctaaaaca	ggtcaggaaa	atggatggga	20160
aaaagatgct	acagaatttt	cagataaaaa	tgaataaaga	gttggaata	attttgccat	20220
ggaaatcaat	ctaaatgcc	acctgtggag	aaatttcctg	tactccaaca	tagcgtgtga	20280
tttgcccgac	aagctaaagt	acagtccttc	caacgtaaaa	atttctgata	acccaaacac	20340
ctacgactac	atgaacaagc	gagtgggtgg	tcccggttta	gtggactgct	acattaaact	20400
tgagacacgc	tggtcccttg	actatatgga	caacgtcaac	ccatttaacc	accaccgcaa	20460
tgctggcctg	cgctaccgct	caatgttgct	gggcaatggt	cgctatgtgc	ccttccacat	20520
ccaggtgcct	cagaagtctt	ttgccattaa	aaacctcctt	ctcctgccgg	gtcctacac	20580
ctacgagtgg	aacttcagga	aggatgttaa	catggttctg	cagagctccc	taggaaatga	20640
cctaagggtt	gacggagcca	gcattaagtt	tgatagcatt	tgcttttacg	ccaccttctt	20700
ccccatggcc	cacaacaccg	cctccacgct	tgaggccatg	cttagaaacg	acaccaacga	20760
ccagtccttt	aacgactatc	tctccgcgcg	caacatgctc	tacctatac	ccgccaacgc	20820
taccaacgtg	cccatatcca	ccccctcccg	caactgggcg	gctttccgcg	gctgggcctt	20880
cacgcgcctt	aagactaagg	aaaccccatc	actgggtctg	ggctacgacc	cttattacac	20940
ctactctggc	tctataccct	acctagatgg	aaccttttac	ctcaaccaca	cctttaagaa	21000
ggtggccatt	acctttgact	cttctgtcag	ctggcctggc	aatgaccgcc	tgcttaccct	21060
caacgagttt	gaaattaagc	gctcagttga	cggggagggt	tacaacgttg	cccagtgtaa	21120
catgacaaa	gactggttcc	tggtacaaat	gctagctaac	tacaacattg	gctaccaggg	21180
cttctatatc	ccagagagct	acaaggaccg	catgtactcc	ttcttttaga	acttccagcc	21240
catgagccgt	caggtggttg	atgatactaa	atacaaggac	taccaacagg	tgggcatcct	21300
acaccaacac	aacaactctg	gatttggttg	ctaccttgcc	cccaccatgc	gcgaaggaca	21360
ggcctaccct	gctaacttcc	cctatccgct	tataggcaag	accgcagttg	acagcattac	21420
ccagaaaaag	tttctttgcg	atcgcacctt	ttggcgcatc	ccattctcca	gtaactttat	21480
gtccatgggc	gcaactcacag	acctgggcca	aaaccttctc	tacgccaact	ccgcccacgc	21540
gctagacatg	acttttgagg	tggatcccat	ggacgagccc	acccttcttt	atgttttggt	21600
tgaagtcttt	gacgtgggtc	gtgtgcaccg	gccgcaccgc	ggcgtcatcg	aaaccgtgta	21660
cctgcgcacg	cccttctcgg	ccggcaacgc	cacaacataa	agaagcaagc	aacatcaaca	21720
acagctgcgc	ccatgggctc	cagtgagcag	gaactgaaag	ccattgtcaa	agatcttggt	21780
tgtgggcat	attttttggg	cacctatgac	aagcgttttc	caggctttgt	ttctccacac	21840
aagctgcgct	gcgcatagct	caatacggcc	ggtcgcgaga	ctggggcggt	acactggatg	21900
gcctttgcct	ggaacccgca	ctcaaaaaca	tgctacctct	ttgagccctt	tggttttctt	21960
gaccagcgac	tcaagcaggt	ttaccagttt	gagtacgagt	cactcctgcg	ccgtagcgcc	22020
attgcttctt	cccccgaccg	ctgtataacg	ctggaaaagt	ccacccaaag	cgtagcggg	22080
cccaactcgg	ccgcctgtgg	actattctgc	tgcatgtttc	tccacgcctt	tgccaactgg	22140

```

ccccaaactc ccatggatca caacccccacc atgaacctta ttaccgggggt acccaactcc 22200
atgctcaaca gtccccaggt acagcccacc ctgcgtcgca accaggaaca gctctacagc 22260
ttcctggagc gccactcgcc ctacttcgcg agccacagtg cgcagattag gaggccact 22320
tctttttgtc acttgaaaaa catgtaaaaa taatgtacta gagacacttt caataaaggc 22380
aaatgctttt attgtacac tctcgggtga ttatttacc ccacccttgc cgtctgcgcc 22440
gtttaaaaat caaaggggtt ctgccgcgca tcgctatgcg ccactggcag ggacacgttg 22500
cgatactggt gtttagtgct ccacttaaac tcaggcacia ccattccgcg cagctcgggtg 22560
aagttttcac tccacaggct gcgcaccatc accaacgcgt ttagcaggtc gggcgccgat 22620
atcttgaagt cgcagttggg gcctccgccc tgcgcgcgag agttgcgata cacagggttg 22680
cagcactgga aactatcag cgcgggtgg tgacgcgtgg ccagcacgct cttgtcggag 22740
atcagatccg cgtccagggt ctcgcggttg ctacgggcga acggagtcaa ctttggtagc 22800
tgccctccca aaaagggcgc gtgcccaggc tttgagttgc actcgaccg tagtggcatc 22860
aaaaggtgac cgtgcccgtt ctgggcgtta ggatacagcg cctgcataaa agccttgatc 22920
tgcttaaaag ccacctgagc ctttgcgcct tcagagaaga acatgccgca agacttgccg 22980
gaaaactgat tggccggaca ggcgcgctcg tgacgcagc accttgcgctc ggtgttgagg 23040
atctgcacca catttcggcc ccaccggttc ttacgatct tggccttgct agactgtctc 23100
ttcagcgcgc gctgcccgtt ttgcgtcgtc acatccattt caatcacgtg ctccttattt 23160
atcataatgc ttccgtgtag acacttaagc tcgccttcga tctcagcgca gcggtgcagc 23220
cacaacgcgc agcccgtggg ctgctgatgc ttgtaggtca cctctgcaaa cgactgcagg 23280
tacgcctgca ggaatcgccc catcatcgct acaaaggtct tgttgctggt gaagggtcagc 23340
tgcaaccgcg ggtgctcctc gtccagccag gtcttgcata cggccgcgag agcttccact 23400
tggtcaggca gtagtttgaa gttgcgcttt agatcggtat ccacgtggta cttgtccatc 23460
agcgcgcgcg cagcctccat gcccttctcc cagcgagaca cgatcggcac actcagcggg 23520
ttcatcacgg taatttcaact ttccgcttcg ctgggctctt cctcttctct ttgcgtccgc 23580
ataccacgcg ccaactgggtc gtcttcattc agccgcgcca ctgtgcgctt acctccttg 23640
ccatgcttga ttagcacggg tgggttgctg aaacccacca tttgtagcgc cacatcttct 23700
ctttcttctc cgtgttcac gattacctct ggtgatggcg ggcgctcggg cttgggagaa 23760
gggcgcttct ttttcttctt gggcgcaatg gccaaatccg ccgcccagggt cgatggccgc 23820
gggctgggtg tgcgcggcac cagcgcgtct tgtgatgagt ctctctcgtc ctcgactcg 23880
atacgcgcgc tcatccgctt ttttgggggc gcccggggag gcggcgcgca cggggagggg 23940
gacgacacgt cctccatggt tgggggacgt cgcgcgcgac cgcgtccgcg ctcggggggtg 24000
gtttcgcgct gctcctcttc ccgactggcc atttctctct cctataggca gaaaaagatc 24060
atggagtcag tcgagaagaa ggacagccta accgccccct ctgagttcgc caccaccgcc 24120
tccaccgatg ccgccaacgc gctaccacc ttccccgtcg aggcaccccc gcttgaggag 24180
gaggaagtga ttatcgagca ggacccagggt tttgtaagcg aagacgacga ggaccgctca 24240
gtaccaacag aggataaaaa gcaagaccag gacaacgcag aggcaaacga ggaacaagtc 24300
gggcgggggg acgaaaaggca tggcgactac ctatagtggt gagacgacgt gctgttgaag 24360
catctgcagc gccagtgcgc cattatctgc gacgcgttgc aagagcgagc cgatgtgccc 24420
ctgcgccatg cggatgtcag ccttgccctac gaacgccacc tattctcacc gcgcgtaccc 24480
cccaaacgcc aagaaaacgg cacatgcgag cccaaccgcg gcctcaactt ctaccccgta 24540
tttgccgtgc cagaggtgct tgccacctat cacatctttt tccaaaactg caagataccc 24600
ctatcttgcc gtgccaaacc cagccgagcg gacaagcagc tggccttgcg gcagggcgct 24660
gtcatacctg atatgcctc gctcaacgaa gtgccaaaaa tctttgaggg tcttgagcgc 24720
gacgagaagc gcgcggcaaa cgctctgcaa caggaaaaca gcgaaaatga aagtcactct 24780
ggagtgttgg tggaaactcga ggggtgacaac gcgcgcctag ccgtactaaa acgcagatc 24840
gaggtcacc cttttgccta cccggcactt aaactacccc ccaaggtcat gagcacagtc 24900
atgactgagc tgatcgtgcg ccgtgcgag cccctggaga gggatgcaaa tttgcaagaa 24960
caaacagagg agggcctacc cgcagttggc gacgagcagc tagcgcgctg gcttcaaacy 25020
cgcgagcctg ccgacttgga ggagcgacgc aaactaatga tggccgcagt gctcgttacc 25080
gtggagcttg agtgcatgca gcggttcttt gctgaccgag agatgcagcg caagctagag 25140
gaaacattgc actacacctt tcgacagggc tacgtacgcc aggcctgcaa gatctccaac 25200
gtggagctct gcaacctggt ctcctacctt ggaattttgc acgaaaaccg ccttgggcaa 25260
aacgtgcttc attccacgct caagggcgag gcgcgcgcg actacgtccg cgactgcgtt 25320
tacttatctc tatgtacac ctggcagacg gccatggcg tttggcagca gtgcttgagg 25380
gagtgaacc tcaaggagct gcagaaactg ctaaagcaaa acttgaagga cctatggacg 25440
gccttcaacg agcgtccgtt ggccgcgcac ctggcggaac tcattttccc cgaacgctg 25500
cttaaaacc tgcaacaggg tctgccagac ttaccagtc aaagcatgtt gcagaacttt 25560
aggaacttta tcctagagcg ctacggaatc ttgcccgcca cctgctgtgc acttccatagc 25620
gactttgtgc ccattaagta ccgcaatgc cctccgcgcg tttggggcca ctgctacctt 25680
ctgcagctag ccaactacct tgctaccac tctgacataa tggaaagcgt gagcgtgac 25740
ggtctactgg agtgtcactg tcgctgcaac ctatgacccc cgcaccgctc cctggtttgc 25800
aattcgagc tgcttaacga agtcaaatt atcggtacct ttgagctgca ggttccctcg 25860
cctgacgaaa agtccgcggc tccggggttg aaactcactc cggggctgtg gacgtcggct 25920
taccttcgca aatttgcacc tgaggactac cagcccacg agattaggtt ctacgaagac 25980
caatcccgcc cgccaaatgc ggagcttacc gcctgcgtca ttaccaggg ccacattctt 26040
ggccaattgc aagccatcaa caagcccgc caagagtttc tgctacgaaa gggacggggg 26100

```

gtttacttgg	acccccagtc	cggcgaggag	ctcaacccaa	tccccccgcc	gccgcagccc	26160
tatcagcagc	agccgcgggc	ccttgcttcc	caggatggca	cccaaaaaa	agctgcagct	26220
gccgccgcc	cccacggacg	aggaggaata	ctgggacagt	caggcagagg	aggttttggg	26280
cgaggaggag	gaggacatga	tggaaagactg	ggagagccta	gacgaggaag	cttcgaggt	26340
cgaagaggtg	tcagacgaaa	caccgtcacc	ctcggtcgca	ttccccctgc	cggcgcccca	26400
gaaatcggca	accggttcca	gcattggtac	aacctccgt	cctcaggcgc	cggcgccact	26460
gcccgttcgc	cgacccaacc	gtagatggga	caccactgga	accagggccg	gtaagtccaa	26520
gcagccgcg	ccgttagccc	aagagcaaca	acagcgccaa	ggctaccgct	catggcgcg	26580
gcacaagaac	gccatagttg	cttgcttgca	agactgtggg	ggcaacatct	ccttcgcccg	26640
ccgcttttct	ctctaccatc	acggcgtggc	cttccccctg	aacatcctgc	attactaccg	26700
tcatctctac	agcccatact	gcacggcgcg	cagcggcagc	ggcagcaaca	gcagcgcca	26760
cacagaagca	aaggcgaccg	gatagcaaga	ctctgacaaa	gccaagaaa	tcacagcgg	26820
cggcagcagc	aggaggagga	gcgctgcgtc	tggcgcccaa	cgaacccgta	tcgacccgcg	26880
agcttagaaa	caggattttt	cccactctgt	atgctatatt	tcaacagagc	aggggccaa	26940
aacaagagct	gaaaataaaa	aacagggtct	tgcgacccct	caccgcgagc	tgctgtatc	27000
acaaaagcga	agatcagctt	cgcgccacgc	tggaaagacg	ggaggctctc	ttcagtaaat	27060
actgcgcgt	gactcttaag	gactagtttc	gcgccccttc	tcaaatttaa	gcgcgaaaac	27120
tacgtcatct	ccagcggcca	caccggcgcc	cagcacctgt	cgctcagcgc	attatgagca	27180
aggaaattcc	cacgcccctac	atgtggagtt	accagccaca	aatgggactt	gcggctggag	27240
ctgcccaga	ctactcaacc	cgaataaaact	acatgagcgc	gggacccca	atgatattcc	27300
gggtcaacgg	aatccgcgcc	caccgaaacc	gaattctctt	ggaacaggcg	gctattacca	27360
ccacacctcg	taataacctt	aatccccgta	gttggcccg	tgccctggtg	taccaggaaa	27420
gtcccgcctc	caccactgtg	gtacttccca	gagacgcca	ggccgaagtt	cagatgacta	27480
actcaggggc	gcagcttgcg	ggcggttttc	gtcacagggt	gcggtcgccc	ggcgagggtg	27540
taactcacc	gacaatcaga	ggcgaggtga	ttcagctcaa	cgacgagtcg	gtgagctcct	27600
cgcttggtct	ccgtccggac	gggacatttc	agatcggcgg	cgccggccgt	ccttcattca	27660
cgctcgtca	ggcaatccta	actctgcaga	cctcgtccct	tgagccgcgc	tctggaggca	27720
ttggaactct	gcaatttatt	gaggagtttg	tgccatcggt	ctactttaac	cccttctcgg	27780
gacctcccgg	ccactatccg	gatcaattta	ttcctaactt	tgacgcggtg	aaggactcgg	27840
cggacggcta	cgactgaatg	ttaagtggag	aggcagagca	actgcgcctg	aaacacctgg	27900
tccactgtcg	ccgccacaag	tgtcttgccc	gcgactcccg	tgagttttgc	tactttgaat	27960
tgcccagagg	tcatatcgag	ggcccggcgc	acggcgctcc	gcttaccgcc	cagggagagc	28020
ttgcccgtag	cctgattcgg	gagtttacc	agcgccccct	gctagttgag	cgggacaggc	28080
gacctgtgtg	tctcactgtg	atttgcaact	gtcctaacct	tggattacat	caagatcttt	28140
gttgccatct	ctgtgctgag	tataataaat	acagaaatta	aaatataactg	gggctcctat	28200
cgccatcctg	taaacgccac	cgtcttcacc	cgcccaagca	aaccaaggcg	aaccttacct	28260
ggtactttta	acatctctcc	ctctgtgatt	tacaacagtt	tcaacccaga	cggagtgaat	28320
ctacgagaga	acctctccga	gctcagctac	tccatcagaa	aaaacaccac	cctccttacc	28380
tgccgggaac	gtacgagtcg	gtcaccggcc	gctgcaccac	acctaccgcc	tgaccgtaaa	28440
ccagactttt	tccggacaga	cctcaataac	tctgtttacc	agaacaggag	gtgagcttag	28500
aaaaccctta	gggtattagg	ccaaggcgcc	agctactgtg	gggtttatga	acaattcaag	28560
caactctacg	ggctattcta	attcaggttt	ctctagaagt	caggcttcct	ggatgtcagc	28620
atctgacttt	ggccagcacc	tgtcccgccg	atttgttcca	gtccaaactac	agcgacccac	28680
cctaacagag	atgaccaaca	caaccaacgc	ggccgcgcgt	accggactta	catctaccac	28740
aaatacaccc	caagttttctg	cctttgtcaa	taactgggat	aacttgggca	tgtggtgggt	28800
ctccatagcg	cttatgtttg	tatgccttat	tattatgtgg	ctcatctgct	gcctaaagcg	28860
caaacgcgcc	cgaccacca	tctatagtc	catcattgtg	ctacacccaa	acaatgatgg	28920
aatccataga	ttggacggac	tgaacacat	gttcttttct	cttacagtat	gattaaatga	28980
gatctagaaa	tggacggaat	tattacagag	cagcgctgc	tagaaagacg	cagggcagcg	29040
gccgagcaac	agcgcatgaa	tcaagagctc	caagacatgg	ttaacttgca	ccagtgcata	29100
aggggtatct	tttgtctggt	aaagcaggcc	aaagtacact	acgacagtaa	taccaccgga	29160
caccgcctta	gctacaagtt	gccaaccaag	cgtcagaaat	tggtgggtcat	ggtgggagaa	29220
aagcccat	ccataactca	gcactcggtg	gaaaccgaag	gctgcattca	ctcaccttgt	29280
caaggacctg	aggatctctg	cacccttatt	aagaccctgt	gcggtctcaa	agatcttatt	29340
ccctttaact	aataaaaaaa	aataataaag	catcacttac	ttaaaaatcag	ttagcaaat	29400
tctgtccagt	ttattcagca	gcacctcctt	gccctcctcc	cagctctggt	attgcagctt	29460
cctcctggct	gcaaactttc	tccacaatct	aaatggaatg	tcagtttctt	cctgttctctg	29520
tccatccgca	cccactatct	tcatgttggt	gcagatgaag	cgcgcaagac	cgtctgaaga	29580
taccttcaac	cccgtgtatc	catatgacac	ggaaaaccgt	cctccaactg	tgcttttctt	29640
tactcctccc	tttgtatccc	ccaatggggt	tcaagagagt	ccccctgggg	tactctcttt	29700
gcgcctatcc	gaacctctag	ttacctccaa	tggcatgctt	gcgctcaaaa	tgggcaacgg	29760
cctctctctg	gacgaggccg	gcaaccttac	ctccaaaat	gtaaccactg	tgagcccacc	29820
tctcaaaaaa	accaagtcaa	acataaacct	ggaaatatct	gcaccctca	cagttacctc	29880
agaagcccta	actgtggctg	cgcgcgacc	tctaattggtc	gcgggcaaca	cactcccat	29940
gcaatcacag	gccccgctaa	ccgtgcacga	ctccaaactt	agcattgcca	cccaaggacc	30000
cctcacagt	tcagaaggaa	agctagccct	gcaaacatca	ggccccctca	ccaccaccga	30060

tagcagtag	cttactatca	ctgcctcacc	ccctctaact	actgccactg	gtagcttggg	30120
cattgacttg	aaagagccca	tttatacaca	aatggaaaa	ctaggactaa	agtacggggc	30180
tcctttgcat	gtaacagacg	acctaaccac	tttgaccgta	gcaactgggtc	cagggtgtgac	30240
tattaataat	acttccttgc	aaactaaagt	tactggagcc	ttgggttttg	attcacaagg	30300
caatatgcaa	cttaatgtag	caggaggact	aaggattgat	tctcaaaaca	gacgccttat	30360
acttgatgtt	agttatccgt	ttgatgtctc	aaaccaacta	aatctaagac	taggacaggg	30420
ccctcttttt	ataaactcag	cccacaactt	ggatattaac	tacaacaaag	gcctttactt	30480
gtttacagct	tcaacaactt	ccaaaaagct	tgagggttaac	ctaagcactg	ccaagggtt	30540
gatgtttgac	gctacagcca	tagccattaa	tgaggagat	gggcttgaat	ttggttcacc	30600
taatgcacca	aacacaaatc	ccctcaaaac	aaaaattggc	catggcctag	aatttgattc	30660
aaacaaggct	atggttccta	aactaggaac	tgcccttagt	tttgacagca	cagggtgcat	30720
tacagtagga	aacaaaaata	atgataagct	aactttgttg	accacaccag	ctccatctcc	30780
taactgtaga	ctaaatgcag	agaaagatgc	taaaactcact	ttggtcttaa	caaatgtgg	30840
cagtcaata	cttgctacag	tttcagtttt	ggctgttaa	ggcagtttg	ctccaatc	30900
tggaacagtt	caaagtgtc	atcttattat	aagatttgac	gaaaatggag	tgctactaaa	30960
caattccttc	ctggaccag	aatattggaa	ctttagaat	ggagatctta	ctgaaggcac	31020
agcctataga	aacgctgttg	gatttatgcc	taacctatca	gcttatccaa	aatctcagcg	31080
taaaactgcc	aaaagtaaca	ttgtcagtc	agtttactta	aacggagaca	aaactaaacc	31140
tgtaacacta	accattacac	taaacggtac	acaggaaaca	ggagacacaa	ctccaagtgc	31200
atactctatg	tcattttcat	gggactgggtc	tgccacacac	tacattaatg	aaatatttgc	31260
cacatctctt	tacacttttt	catactatgc	ccaagaataa	agaatcggtt	gtgttatgtt	31320
tcaacgtgtt	tatttttcaa	ttgcagaaaa	tttcaagtca	tttttcttcc	agtagtatag	31380
ccccaccacc	acatagctta	tacagatcac	cgtaccttaa	tcaaactcac	agaaccctag	31440
tattcaacct	gccacctccc	tccaacacac	cagagtacac	agtcctttct	ccccggctgg	31500
ccttaaaaaa	catcatatca	tggttaacag	acatattctt	aggtgttata	ttccacacgg	31560
tttctgtctg	agccaaacgc	tcacagtgga	tattaataaa	ctccccgggc	agctcactta	31620
agttcatgtc	gctgtccagc	tgctgagcca	caggctgtctg	tccaacttgc	ggttgcttaa	31680
cgggcggcga	aggagaagtc	cacgcctaca	tgggggtaga	gtcataatcg	tgcatcagga	31740
tagggcggtg	gtgctgcagc	agcgcgcgaa	taaaactgtg	ccgcgcgcgc	tccgtctctg	31800
aggaatacaa	catggcagtg	gtctcctcag	cgatgattcg	caccgcccgc	agcataaggc	31860
gccttgtcct	ccgggcacag	cagcgcaccc	tgatctcact	taaatcagca	cagtaactgc	31920
agcacagcac	cacaatattg	ttcaaaatcc	cacagtgcga	ggcgtgtgat	ccaaagctca	31980
tgggcggggac	cacagaaccc	acgtggccat	cataccacaa	gcgcaggtag	attaagtggc	32040
gacctctcat	aaacacgtcg	gacataaaca	ttacctcttt	tgcatgtttg	taattcaca	32100
cctcccggtg	ccatataaac	ctctgattaa	acatggcgcc	atccaccacc	atcctaaacc	32160
agctggccaa	aacctgccc	ccggtatata	actgcaggga	accgggactg	gaacaatgac	32220
agtggagagc	ccaggactcg	taaccatgga	tcactatgct	cgcatgata	tcaatgtttg	32280
cacaacacag	gcacacgtgc	atacacttcc	tcaggattac	aagctcctcc	cgcgtagaaa	32340
ccatatccca	gggaacaacc	cattctctgaa	tcagcgtaaa	tccacactg	cagggaagac	32400
ctcgcacgta	actcacgttg	tgcatgttca	aagtgttaca	ttcgggcagc	agcggatgat	32460
cctccagtat	ggtagcgcg	gtttctgtct	caaaaggagg	tagacgatcc	ctactgtacg	32520
gagtgccg	agacaaccga	gatcgtgttg	gtcgtagtgt	catgccaaat	ggaacgcccg	32580
acgtagtcat	atttctgaa	gcaaaaccag	gtcggggcgt	gacaaacaga	tctgcgtctc	32640
cggctctg	gcttagatcg	ctctgtgtag	tagttgtagt	atatccactc	tctcaaagca	32700
tccaggcgcc	ccctggcttc	gggttctatg	taaaactcct	catgcgccgc	tgccctgata	32760
acatccacca	ccgcagaata	agccacaccc	agccaaacct	cacattcggt	ctgcgagtca	32820
cacacgggag	gagcgggaag	agctggaaga	accatgtttt	tttttttatt	ccaaaagatt	32880
atccaaaacc	tcaaaatgaa	gatctattaa	gtgaacgcgc	tccccctcgg	tgccgtggtc	32940
aaactctaca	gccaaagaac	agataatggc	atttgttaaga	tggtgcacaa	tggtctccaa	33000
aaggcaaacg	gccctcacgt	ccaagtggac	gtaaaggcta	aacctctcag	ggtgaatctc	33060
ctctataaac	attccagcac	cttcaacctt	gccccaaata	ttctcatctc	gccaccttct	33120
caatatatct	ctaagcaaat	ccggaatatt	aagtccggcc	attgtaaaaa	tctgctccag	33180
agcgcctctc	accttcagcc	tcaagcagcg	aatcatgatt	gcaaaaattc	aggttctctc	33240
cagacctgta	taagattcaa	aagcggaaac	ttaacaaaaa	taccgcgac	ccgtaggtcc	33300
cttcgcagg	ccagctgaac	ataatcgtgc	aggtctgcac	ggaccagcgc	ggccacttcc	33360
ccgccaggaa	ccttgacaaa	agaaccacac	ctgattatga	cacgcatact	cggagctatg	33420
ctaaccagcg	tagccccgat	gtaagctttg	ttgcatgggc	ggcgatataa	aatgcaaggt	33480
gctgctcaaa	aatcaggca	aagcctcgcg	caaaaaagaa	agcacatcgt	agtcagtctc	33540
atgcagataa	aggcaggtaa	gtcccggaac	caccacagaa	aaagacacca	tttttctctc	33600
aaacatgtct	gcgggtttct	gcataaacac	aaaataaaat	aacaaaaaaa	catttaacca	33660
tagaagcct	gtcttacaac	aggaaaaaac	acccttataa	gcataagacg	gactacggcc	33720
atgccggcgt	gaccgtaaaa	aaactgttca	ccgtgattaa	aaagcaccac	cgacagctcc	33780
tcggtcatgt	ccggagtcat	aatgtaagac	tcggtaaac	catcaggttg	attcatcggt	33840
cagtgctaaa	aagcgaccga	aatagcccg	gggaatacat	acccgcaggc	gtagagacaa	33900
cattacagcc	cccataggag	gtataacaaa	attaatagga	gagaaaaaca	cataaacacc	33960
tgaaaaaacc	tcctgcctag	gcaaaatagc	accctccgcg	tccagaacaa	catacagcgc	34020

```

ttcacagcgg cagcctaaca gtcagcctta ccagtaaaaa agaaaaccta ttaaaaaaac 34080
accactcgac acggcaccag ctcaatcagt cacagtgtaa aaaaggggcca agtgccagagc 34140
gagtatatat aggactaaaa aatgacgtaa cggttaaaagt ccacaaaaaa caccagaaaa 34200
accgcacgcg aacctacgcc cagaaacgaa agccaaaaaa cccacaactt cctcaaatacg 34260
tcacttccgt tttcccacgt tacgtaactt cccattttta gaaaactaca attcccaaca 34320
catacaagtt actccgccct aaaacctacg tcacccgccc cgttcccacg cccgcgcga 34380
cgtcacaaac tccaccccct cattatcata ttggcttcaa tccaaaataa ggtatattat 34440
tgatgatg                                     34448

```

<210> 5
 <211> 94
 <212> PRT
 <213> Adenovirus subgroup C

```

<400> 5
Met Val Asp Thr Val Asn Ser Tyr Asn Thr Ala Thr Gly Leu Thr Ser
  1                      5                      10                      15

Ala Leu Asn Leu Pro Gln Val Ser Thr Phe Val Asn Asn Trp Ala Asn
                20                      25                      30

Leu Gly Met Trp Trp Phe Ser Ile Ala Leu Met Phe Val Cys Leu Ile
  35                      40                      45

Ile Met Trp Leu Ser Cys Cys Leu Lys Arg Lys Arg Ala Arg Pro Pro
  50                      55                      60

Ile Tyr Lys Pro Ile Ile Val Leu Asn Pro Asn Asn Asp Gly Ile His
  65                      70                      75                      80

Arg Leu Asp Gly Leu Asn Thr Cys Ser Phe Ser Phe Ala Val
                85                      90

```

<210> 6
 <211> 101
 <212> PRT
 <213> Adenovirus subgroup C

```

<400> 6
Met Thr Gly Ser Thr Ile Ala Pro Thr Thr Asp Tyr Arg Asn Thr Thr
  1                      5                      10                      15

Ala Thr Gly Leu Thr Ser Ala Leu Asn Leu Pro Gln Val His Ala Phe
                20                      25                      30

Val Asn Asp Trp Ala Ser Leu Asp Met Trp Trp Phe Ser Ile Ala Leu
  35                      40                      45

Met Phe Val Cys Leu Ile Ile Met Trp Leu Ile Cys Cys Leu Lys Arg
  50                      55                      60

Arg Arg Ala Arg Pro Pro Ile Tyr Arg Pro Ile Ile Val Leu Asn Pro
  65                      70                      75                      80

His Asn Glu Lys Ile His Arg Leu Asp Gly Leu Lys Pro Cys Ser Leu
                85                      90                      95

Leu Leu Gln Tyr Asp
                100

```

<210> 7
 <211> 93
 <212> PRT
 <213> Adenovirus subgroup C

<400> 7

```

Met Thr Asn Thr Thr Asn Ala Ala Ala Thr Gly Leu Thr Ser Thr
 1             5             10             15

Thr Asn Thr Pro Gln Val Ser Ala Phe Val Asn Asn Trp Asp Asn Leu
      20             25             30

Gly Met Trp Trp Phe Ser Ile Ala Leu Met Phe Val Cys Leu Ile Ile
      35             40             45

Met Trp Leu Ile Cys Cys Leu Lys Arg Lys Arg Ala Arg Pro Pro Ile
      50             55             60

Tyr Ser Pro Ile Ile Val Leu His Pro Asn Asn Asp Gly Ile His Arg
      65             70             75             80

Leu Asp Gly Leu Lys His Met Phe Phe Ser Leu Thr Val
      85             90

```

<210> 8

<211> 95

<212> PRT

<213> Adenovirus subgroup C

<400> 8

```

Met Val Asp Thr Val Asn Ser Tyr Asn Thr Ala Thr Gly Leu Lys Ser
 1             5             10             15

Ala Leu Asn Leu Pro Gln Val His Ala Phe Val Asn Asp Trp Ala Ser
      20             25             30

Leu Gly Met Trp Trp Phe Ser Ile Ala Leu Met Phe Val Cys Leu Ile
      35             40             45

Ile Met Trp Leu Ile Cys Cys Leu Lys Arg Arg Arg Ala Arg Pro Pro
      50             55             60

Ile Tyr Arg Pro Ile Ile Val Leu Asn Pro His Asn Glu Lys Ile His
      65             70             75             80

Arg Leu Asp Gly Leu Lys Pro Cys Ser Leu Leu Leu Gln Tyr Asp
      85             90             95

```

<210> 9

<211> 78

<212> PRT

<213> Adenovirus subgroup C

<400> 9

```

Met Thr Gly Ser Thr Ile Ala Pro Thr Thr Asp Tyr Arg Asn Thr Thr
 1             5             10             15

Ala Thr Gly Leu Thr Ser Ala Leu Asn Leu Pro Gln Val His Ala Phe
      20             25             30

Val Asn Asp Trp Ala Ser Leu Asp Met Trp Trp Phe Ser Ile Ala Leu
      35             40             45

Met Phe Val Cys Leu Ile Ile Met Trp Leu Ile Cys Cys Leu Lys Arg
      50             55             60

Arg Arg Ala Arg Pro Pro Ile Tyr Arg Pro Ile Ile Val Leu
      65             70             75

```

```
<210> 10
<211> 87
<212> PRT
<213> Adenovirus subgroup C
```

```
<400> 10  
Met Thr Gly Ser Thr Ile Ala Pro Thr Thr Asp Tyr Arg Asn Thr Thr  
   1                               5                             10                            15  
  
Ala Thr Gly Leu Thr Ser Ala Leu Asn Leu Pro Gln Val His Ala Phe  
                                20                              25                             30  
  
Val Asn Asp Trp Ala Ser Leu Asp Met Trp Trp Phe Ser Ile Ala Leu  
        35                      40                    45  
  
Met Phe Val Cys Leu Ile Ile Met Trp Leu Ile Cys Cys Leu Lys Arg  
    50                          55                        60  
  
Arg Arg Ala Arg Pro Pro Ile Tyr Arg Pro Ile Gly Leu Lys Pro Cys  
  65                   70                       75                     80  
  
Ser Leu Leu Leu Gln Tyr Asp  
                85
```

```
<210> 11
<211> 77
<212> PRT
<213> Adenovirus subgroup C
```

```

<400> 11
Met Thr Gly Ser Thr Ile Ala Pro Thr Thr Asp Tyr Arg Asn Thr Thr
  1          5          10          15
Ala Thr Gly Leu Thr Ser Ala Leu Asn Leu Pro Gln Val His Ala Phe
      20          25          30
Val Asn Asp Trp Ala Ser Leu Asp Met Trp Trp Phe Ser Ile Ala Leu
      35          40          45
Met Phe Val Cys Leu Ile Ile Met Trp Leu Ile Cys Cys Leu Lys Arg
      50          55          60
Arg Arg Ala Arg Pro Pro Ser Leu Leu Leu Gln Tyr Asp
      65          70          75

```

```
<210> 12
<211> 84
<212> PRT
<213> Adenovirus subgroup C
```

```

<400> 12
Met Thr Gly Ser Thr Ile Ala Pro Thr Thr Asp Tyr Arg Asn Thr Thr
  1                      5                      10                      15

Ala Thr Gly Leu Thr Ser Ala Leu Asn Leu Pro Gln Ile Ala Leu Met
      20                      25                      30

Phe Val Cys Leu Ile Ile Met Trp Leu Ile Cys Cys Leu Lys Arg Arg
      35                      40                      45

Arg Ala Arg Pro Pro Ile Tyr Arg Pro Ile Ile Val Leu Asn Pro His
  50                      55                      60

```

Asn Glu Lys Ile His Arg Leu Asp Gly Leu Lys Pro Cys Ser Leu Leu
 65 70 75 80

Leu Gln Tyr Asp

<210> 13
 <211> 35724
 <212> DNA
 <213> Adenovirus subgroup C

<400> 13
 catcatcaat aatatacctt attttggatt gaagccaata tgataatgag ggggtggagt 60
 ttgtgacgtg gcgcggggcg tgggaacggg gcgggtgacg tagtagtgtg gcggaagtgt 120
 gatgttgcaa gtgtggcgga acacatgtaa gcgacggatg tggcaaaagt gacgtttttg 180
 gtgtgcgccc gtgtacacag gaagtgacaa ttttcgcgcg gttttaggcg gatgtttag 240
 taaattttgg cgtaaccgag taagatttgg ccattttcgc gggaaaactg aataagagga 300
 agtgaaatct gaataatttt gtgttactca tagcgcgtaa tatttgtcta gggccgagg 360
 gactttgacc gtttacgtgg agactcgccc aggtgttttt ctcagggtgt ttccgcgttc 420
 cgggtcacaag ttggcgtttt attattatag tcagctgacg ttagtgttat ttatacccg 480
 tgagtctctc aagaggccac tcttgagtgc cagcgagtag agttttctcc tccgagccgc 540
 tccgacaccg ggactgaaaa tgagacatga ggtactggct gataatcttc cacctcctag 600
 ccattttgaa ccacctaccc ttcacgaact gtatgattta gacgtgacgg cccccgaaga 660
 tccccacgag gaggcggttt cgcagatttt tcccgaactc gtaatgttgg cgggtgcagga 720
 agggattgac ttactcactt ttccgcggcg gcccggttct ccggagccgc ctcaccttcc 780
 ccggcagccc gagcagcccg agcagagagc cttgggtccg gtttgccacg aggctggctt 840
 tccaccagct gacgacgagg atgaagaggg tgaggagtgt gtgttagatt atgtggagca 900
 ccccgggcac ggttgacagt cttgtcatta tcaccggagg aatacggggg acccagatat 960
 tatgtgttcg ctttgctata tgaggacctg tggcatgttt gtctacagta agtgaaaatt 1020
 atgggcagtg ggtgatagag tgggtgggtt ggtgtgtgta tttttttttt aatttttaca 1080
 gttttgtggt ttaaagaatt ttgtatttgt atttttttaa aaggtcctgt gtctgaacct 1140
 gagcctggag ccgagccaga accggagcct gcaagacctc cccgcgctcc taaaatggcg 1200
 cctgctatcc tgagacgccc gacatcacct gtgtctagag aatgcaatag tagtacggat 1260
 agctgtgact ccggtccttc taacacacct cctgagatac acccggtggt cccgctgtgc 1320
 cccattaaac cagttgccgt gagagtgggt gggcgctcgc aggctgtgga atgtatcgag 1380
 gacttgctta acgagcctgg gcaacctttg gacttgagct gtaaacgccc caggccataa 1440
 ggtgtaaacc tgtgattgag tgtgtgggta acgcctttgt ttgctgaatg agttgatgta 1500
 agtttaataa aggggtgagat aatgtttaac ttgcatggcg tgttaaatgg ggcggggctt 1560
 aaagggtata taatgcgcg tgggctaact ttgggtacat ctgacctcat ggaggcttgg 1620
 gagtgtttgg aagatttttc tgcgtgtcgt aacttgctgg aacagagctc taacagtacc 1680
 tcttggtttt ggaggtttct gtggggctca tcccaggcaa agttagtctg cagaattaag 1740
 gaggattaca agtgggaatt tgaagagctt ttgaaatcct gtggtgagct gtttgattct 1800
 ttgaatctgg gtcaccaggc gcttttccaa gagaaggtca tcaagacttt ggatttttcc 1860
 acaccggggc gcgctgcggc tgcgtgtgct tttttgagtt ttataaagga taaatggagc 1920
 gaagaaaccc atctgagcgg ggggtacctg ctggattttc tggccatgca tctgtggaga 1980
 gcggttgtga gacacaagaa tcgcctgcta ctgttgtctt ccgtccgccc ggcgataata 2040
 ccgacggagg agcagcagca gcagcaggag gaagccaggc ggcggcgcca ggagcagagc 2100
 ccattggaac cgagagcccg cctggaccct cgggaatgaa tgttgtacag gtggctgaac 2160
 tgtatccaga actgagacgc attttgacaa ttacagagga tgggcagggg cttaaaggggg 2220
 taaagaggga gcggggggct tgtgaggcta cagaggaggc taggaatcta gcttttagct 2280
 taatgaccag acaccgtcct gagtgtatta cttttcaaca gatcaaggat aattgcgcta 2340
 atgagcttga tctgtggtgg cagaagtatt ccatagagca gctgaccact tactggctgc 2400
 agccagggga tgattttgag gaggtatata gggatatgca aaagggtgca cttaggccag 2460
 attgcaagta caagatcagc aaacttgtaa atatcaggaa ttgttgctac atttctggga 2520
 acggggccga ggtggagata gatacggagg atagggtggc ctttagatgt agcatgataa 2580
 atatgtggcc ggggtgtgct ggcatggacg ggggtgttat tatgaatgta aggtttactg 2640
 gcccaattt tagcggtagc gttttcctgg ccaataccaa ccttatccta cagggtgtaa 2700
 gcttctatgg gtttaacaat acctgtgtgg aagcctggac cgatgtaagg gttcggggct 2760
 gtgcctttta ctgctgctgg aaggggttgg tgtgtcggcc caaaagcagg gcttcaatta 2820
 agaaatgcct ctttgaaagg tgtaccttgg gtatcctgtc tgagggtaac tccagggtgc 2880
 gccacaatgt ggcctccgac tgtggttgc tcatgctagt gaaaagcgtg gctgtgatta 2940
 agcataacat ggtatgtggc aactgcgagg acagggcctc tcagatgctg acctgctcgg 3000
 acggcaactg tcacctgctg aagaccattc acgtagccag ccactctcgc aaggcctggc 3060
 cagtgtttga gcataacata ctgacccgct gttccttgca tttgggtaac aggagggggg 3120

```

rgttcctacc ttaccaatgc aatttgagtc acactaagat attgcttgag cccgagagca 3180
tgtccaaggt gaacctgaac ggggtgtttg acatgaccat gaagatctgg aaggtgctga 3240
ggtacgatga gaccgcgacc aggtgcagac cctgcgagtg tggcggtaaa catattagga 3300
accagcctgt gatgctggat gtgaccgagg agctgaggcc cgatcacttg gtgctggcct 3360
gcacccgcgc tgagtttggc tctagcgatg aagatacaga ttgaggtact gaaatgtgtg 3420
ggcgtggcctt aagggtggga aagaatatat aaggtggggg tcttatgtag tttgtatct 3480
gttttgagc agccgcgccc gccatgagca ccaactcgtt tgatggaagc attgtgagct 3540
catatttgac aacgcgcgatg ccccatggg ccggggtgcg tcagaatgtg atgggctcca 3600
gcattgatgg tcgccccgtc ctgcccgcga actctactac cttgacctac gagaccgtg 3660
ctggaacgcc gttggagact gcagcctccg ccgcgcttc agccgctgca gccaccgcc 3720
gcgggattgt gactgacttt gctttcctga gcccgcttgc aagcagtgca gcttcccgtt 3780
catccgcccg cgatgacaag ttgacggctc ttttggcaca attggattct ttgaccggg 3840
aacttaatgt cgtttctcag cagctgttg atctgcgcca gcaggttct gccctgaagg 3900
cttctctccc tcccaatgcg gtttaaaaa taaataaaaa accagactct gtttgattt 3960
ggatcaagca agtgtcttc gtctttatt taggggtttt gcgcgcgagg tagggccggg 4020
accagcggtc tcggtcgttg agggctctgt gtattttttc caggacgtgg taaagtgac 4080
tctggatgtt cagatacatg gccataagcc cgtctctggg gtggaggtag caccactgca 4140
gagcttcatg ctgcgggggtg gtgtgttaga tgatccagtc gtagcaggag cgctgggctg 4200
gggtgcctaaa aatgtcttcc agtagcaagc tgattgccag gggcaggccc ttggtgtaag 4260
tgtttacaaa gcggttaagc tgggatgggt gcatacgtgg ggatatgaga tgcactcttg 4320
actgtatttt taggttggt atgttcccag ccataccct ccggggattc atgttgtgca 4380
gaaccaccag cacagtgtat ccggtgcact tgggaaattt gtcagttagc ttagaaggaa 4440
atgctgggaa gaacttgag acgcccctgt gacctccaag attttccatg cattcgtcca 4500
taatgatggc aatgggcca cgggcgcgcg cctgggcgaa gatatttctg ggatcactaa 4560
cgtcatagtt gtgttccagg atgagatcgt cataggccat tttacaaaag cgcgggcgga 4620
gggtgcagaa ctgcggtata atggttccat ccggcccagg ggcgtagtta cctcacaga 4680
tttgcatctc ccacgctttg agttcagatg ggggatcat gtctacctgc gggcgatga 4740
agaaaaaggt ttccggggtg gggagatca gctgggaaga aagcaggttc ctgagcagct 4800
gcgacttacc gcagccggtg gggccgtaaa tcacacctat taccgggtgc aactggtagt 4860
taagagagct gcagctgcg tcacccctga gcaggggggc cacttcgtta agcatgtccc 4920
tgactcgcat gttttccctg accaaatccg ccagaaggcg ctgcgccc agcgatagca 4980
gttcttgcaa ggaagcaaa tttttcaacg gtttgagacc gtccgcccga ggcattgctt 5040
tgagcgtttg accaagcagt tccaggcggt ccacagctc ggtaacctgc tctacggcat 5100
ctcgatccag catatctcct cgtttcgcg gtggggcggt cttcgctgt acggcagtag 5160
tcggtgctcg tccagacggg ccagggtcat gtctttccac gggcgaggg tccctcgtag 5220
cgtagtctgg gtcacggtga aggggtgcgc tccgggctgc gcgctggcca gggctgcgtt 5280
gaggctggtc ctgctggtgc tgaagcgtcg ccggtcttcg ccctgcgctg cggccaggtt 5340
gcatttgacc atggtgtcat agtccagccc ctccgcgcg tggcccttgg cgcgcagctt 5400
gcccttgag gaggcgccgc acgaggggca gtgcagactt ttgagggcgt agagcttggg 5460
cgcgagaaa accgattccg gggagtaggc atccgcgccc caggccccc agacgggtct 5520
gcattccacg agccaggtga gctctggccg ttcgggggtca aaaaccaggt ttccccatg 5580
ctttttgatg cgtttcttac ctctggtttc catgagccgg tgtccacgct cggtgacgaa 5640
aaggctgtcc gtgtcccggt atacagactt gagaggcctg tcctcgagcg gtgtcccg 5700
gtcctcctcg tatagaaact cggaccactc tgagacaaag gctcgcgtcc aggccagcac 5760
gaaggaggct aagtgggagg ggtagcggtc gttgtccact aggggggtca ctgcctccag 5820
ggtgtgaaga cacatgtcgc cctcttcggc atcaaggaa gtgattggtt ttaggtgta 5880
ggccacgtga ccgggtgttc ctgaagggg gctataaaa ggggtgggg cgcgttcgtc 5940
ctcactctct tccgcacgcg tgtctgcgag ggcagctgt tggggtgagt actccctctg 6000
aaaagcgggc atgacttctg cgctaagatt gtcagtttcc aaaaacgagg aggatttgat 6060
attcacctgg ccgcggtga tgcttttag ggtggccgca tccatctggt cagaaaagac 6120
aatctttttg ttgtcaagct tgggtggaaa cgaccctag agggcggttg acagcaactt 6180
ggcgatggag cgcagggttt ggtttttgtc gcgatccgcg cgtccttgg ccgcgatgtt 6240
tagctgcacg tattcgcgcg caacgcaccg ccattcgga aagacgggtg tgcgctcgtc 6300
gggcaccagg tgcacgcgcc aaccgcggtt gtgcagggtg acaagggtcaa cgctgggtgc 6360
tacctctccg cgtaggcgct cgttggtcca gcagaggcg ccgcccttgc gcgagcagaa 6420
tggcggtagg ggtctagct gcgtctcgtc cggggggtct gcgtccacg taaagacccc 6480
gggcagcagg cgcgcgtcga agtagtctat cttgcatcct tgcaagtcta gcgcctgctg 6540
ccatgcgcgg cgggcaagcg cgcgtcgtga tgggttgagt gggggacccc atggcatggg 6600
gtgggtgagc gcggaggcgt acatgccgca aatgtcgtaa acgtagagg gctctctgag 6660
tattccaaga tatgtagggt agcatcttcc accgcggatg ctggcgcgca cgtaatcgta 6720
tagttcgtgc gaggagcga ggaggtcgg accgaggttg ctacggggcg gctgctctgc 6780
tcggaagact atctgcctga agatggcatg tgagttggat gatattggtg gacgctggaa 6840
gacgttgaag ctggcgtctg tgagacctac cgcgtcacgc acgaaggag cgtaggagtc 6900
gcgcagcttg ttgaccagct cggcggtgac ctgcacgtct agggcgagc agtccagggt 6960
ttccttgatg atgtcatact tatcctgtcc ctttttttcc cacagctcgc ggttgaggac 7020
aaactcttcg cgttctttcc agtactcttg gatcgaaac ccgtcggcct ccgaacggta 7080

```

agagcctagc atgtagaact ggttgacggc ctggttagcg cagcatccct tttctacggg 7140
 tagcgcgat gcctgcgcgg ccttccggag cgaggtgtgg gtgagcgcaa aggtgtccct 7200
 gaccatgact ttgaggtact ggtatttgaa gtcagtgtcg tcgcatccgc cctgctccca 7260
 gagcaaaaag tccgtgcgct ttttgaacg cggatttggc agggcgaaag tgacatcggt 7320
 gaagagtatc tttcccgcg caggcataaa gttgcgtgtg atgcggaagg gtcccgccac 7380
 ctcggaacgg ttgttaatta cctgggcggc gagcacgac tcgtcaaaag cgttgatgtt 7440
 gtggcccaca atgtaaagtt ccaagaagcg cgggatgccc ttgatggaag gcaatttttt 7500
 aagttcctcg taggtgagct cttcagggga gctgagcccg tgcctgaaa gggccagtc 7560
 tgcaagatga gggttggaag cgacgaatga gctccacagg tcacgggcca ttagcatttg 7620
 caggtggctg cgaagggtcc taaactggcg acctatggcc attttttctg ggtgatgca 7680
 gtagaaggta agcgggtctt gttcccgagc gtcccatcca aggttcgcgg ctaggtctcg 7740
 cgcggcagtc actagaggct catctccgcc gaacttcacg accagcatga agggcacggt 7800
 ctgcttccca aaggccccc tccaagtata ggtctctaca tcgtaggtga caaagagacg 7860
 ctcggtgcga ggtatgcgagc cgatcgggaa gaactggatc tcccgcacc aattggagga 7920
 gtggtatttg atgtggtgaa agtagaagtc cctgcgacgg gccgaacact cgtgctggct 7980
 tttgtaaaaa cgtgcgcagt actggcagcg gtgcacgggc tgtacatcct gcacgaggtt 8040
 gacctgacga ccgcgcacaa ggaagcagag tgggaatttg agccctcgc ctggcgggtt 8100
 tggctggtg tcttctactt cggctgcttg tcttgaccg tctggtgct cgaggggagt 8160
 tacggtggt cggaccacca cgccgcgcga gcccaaagtc cagatgtccg cgccggcgcg 8220
 tcggagcttg atgacaacat cgccgagatg ggagctgtcc atggtctgga gctcccgcg 8280
 cgtcaggtca ggcgggagct cctgcaggtt tacctcgat agacgggtca gggcgcgcg 8340
 tagatccagg tgatacctaa tttccagggg ctggttgggt gcggcgctga tggcttgcaa 8400
 gaggccgcat ccccgcgcg cgactacggt accgcgcggc gggcggtggg ccgcgggggt 8460
 gtccttggt gatgcatcta aaagcgggtga cgccggcgag ccccgaggag tagggggggc 8520
 tccggaccgg ccgggagagg gggcaggggc acgtcggcg cgccgcggcg caggagctg 8580
 tgctgcgcgc gtggttgct ggcaacgcg acgacgcggc ggttgatctc ctgaatctgg 8640
 cgctctcg tgaagacgac gggcccgtg agcttgagcc tgaagagag ttcgacagaa 8700
 tcaatttcg tgcgttgac ggcggcctg cgcaaatct cctgcacgtc tctgagttg 8760
 tcttgatagg cgatctcg ccatgaactgc tcgatctctt cctcctggag atctccgct 8820
 ccggtcgcct ccacgggtggc ggcgaggtcg ttgaaatgc gggccatgag ctgcgagaa 8880
 gcgttgaggc ctccctcgtt ccagacgcgg ctgtagacca cgccccctt ggcatcgcg 8940
 gcgcgcatga ccacctgcgc gagattgagc tcacgtgcc gggcgaaagac ggcgtagt 9000
 cgccagcgct gaaagaggt gttgaggtg gtggcggtg gttctgccac gaagaagtac 9060
 ataaccagc gtcgcaactg ggttcgttg atatcccca aggcctcaag gcgtccatg 9120
 gcctcgtaga agtccacggc gaagtggaaa aactgggagt tgcgcgccga cacggttaac 9180
 tctcctcca gaagacggat gactcggcg acagtgtcgc gcacctcgc ctcaaaggct 9240
 acaggggctt cttcttctt tccaatctcc tcttccataa gggcctcccc tcttcttct 9300
 tctggcgcg gtgggggagg ggggacacgg cgccgacgac ggcgcaccgg gaggcggtc 9360
 acaaagcgct cgatcatctc ccccgggcga cgccgcatgg tctcggtgac ggcggggcg 9420
 ttctcgcg ggcgcagttg gaagacgcg cccgtcatgt cccggttatg ggttggcg 9480
 gggctgcat cgccgagggg tacggcgcta acgatgcat tcaacaattg ttgtgtaggt 9540
 actcccgcg cgagggaact gagcgagtc gcacgaccg gatcgaaaa cctctccaga 9600
 aaggcgtcta accagtcaca gtcgcaaggt aggtgagca ccgtggcggg cgccagcg 9660
 cgccggtcg ggttggttct ggcggaggtg ctgctgatga tgtaattaaa gtaggcggtc 9720
 ttgagacggc ggttggtcga cagaagcacc atgtctctg gtccggcctg ctgaatgcgc 9780
 aggcggtcg ccatgcccc ggcttcgtt tgacatcggc gcaggtctt tagtagtct 9840
 tgcataggc tttctaccgg cacttcttct tctccttct cttgtcctgc atctcttca 9900
 tctatcgct ggcggcgcg gtagtttggc cgtaggtggc gccctcttcc tcccatgcgt 9960
 gtgacccga agccctcat cggctgaagc agggctaggt cggcgacaa cgctcggct 10020
 aatatggcct gctgcacctg cgtgagggtg gactggaagt catccatgt cacaagcgg 10080
 tggatgcgc ccgtgttgat ggtgtaagt cagttggcca taacggacca gtaacggct 10140
 tggtagcccg gctgcgagag ctcggtgtac ctgagacgg agtaagccct cgagtcaaat 10200
 acgtagtcgt tgcaagtccg caccaggtac tggtagtcca ccaaaaagt cggcgcgcg 10260
 tggcggtaga ggggcccagc taggggtggc ggggctccgg gggcgagatc tccaacata 10320
 aggcgatgat atccgtagat gtacctggac atccaggtga tgcggcgcg ggtggtgga 10380
 gcgcgcggaa agtcgcggac gcggttccag atgttgcga gcggcaaaaa gtgctccatg 10440
 gtcgggacgc tctggccggc caggcgcgcg caatcgttga cgctctagcg tgcaaaagga 10500
 gagctgttaa gcgggcactc ttccgtggc tggtagataa attcgcaagg gtatcatggc 10560
 ggacgacggc ggttcgagc ccgtatccgg ccgtcccgcg tgatccatgc ggttaccgcc 10620
 cgctgtcga acccaggtgt gcgacgtcag acaacggggg agtgctcctt ttggcttct 10680
 tccaggcgcg gcggctgctg cgtagcttt tttggccact ggccgcgcgc agcgtaagcg 10740
 gttaggtcg aaagcgaaa cattaagtgg ctgcctccct gtagccggag ggttattttc 10800
 caagggttga gtcgcgggac ccccggttc agtctcgac cgcccgact gcggcgaaac 10860
 ggggtttgcc tcccgtcat gcaagacccc gcttgcaaat tctccggaa acagggcaga 10920
 gcccctttt tgcttttccc agatgcatcc ggtgctcgcg cagatgcgc cccctcctca 10980
 gcagcgcaa gagcaagagc agcggcagac atgcagggca ccctcccctc ctctaccgc 11040

gtcaggagg	gcgacatccg	cgggtgacgc	ggcagcagat	ggtgattacg	aacccccgcg	11100
gcgcggggcc	cggcactacc	tggacttggg	ggagggcgag	ggcctggcgc	ggctaggagc	11160
gccctctcct	gagcgttacc	caagggtgca	gctgaagcgt	gatacgcggt	aggcgtacgt	11220
gccgcggcag	aacctgtttc	gcgaccgcga	gggagaggag	cccgaaggaga	tgccgggatcg	11280
aaagtccac	gcagggcgcg	agctgcggca	tggectgaat	cgcgagcggt	tgctgcgcga	11340
ggaggacttt	gagcccgacg	cgcgaaccgg	gattagtccc	gcgcgcgcac	acgtggcgcg	11400
cgccgacctg	gtaaccgcat	acgagcagac	ggtgaaccag	gagattaact	ttcaaaaaag	11460
ctttaacaac	cacgtgcgta	cgcttggtgc	gcgcgaggag	gtggctatag	gactgatgca	11520
tctgtgggac	tttgtaagcg	cgctggagca	aaacccaaat	agcaagccgc	tcatggcgca	11580
gctgttcctt	atagtgcagc	acagcaggga	caacgaggca	ttcagggatg	cgctgctaaa	11640
catagtagag	cccgaaggcc	gctggctgct	cgatttgata	aacatcctgc	agagcatagt	11700
ggtgcaggag	cgcagcttga	gcctggctga	caaggtggcc	gccatcaact	attccatgct	11760
tagcctgggc	aagttttacg	cccgcagat	ataccatacc	ccttacgttc	ccatagacaa	11820
ggaggtaaa	atcgaggggt	tctacatgct	catggcgctg	aaggtgctta	ccttgagcga	11880
cgacctgggc	gtttatcgca	acgagcgcat	ccacaaggcc	gtgagcgta	gccggcgcg	11940
cgagctcagc	gaccgcgagc	tgatgcacag	cctgcaaagg	gccctggctg	gcacggggcag	12000
cggcgataga	gaggccgagt	cctactttga	cgcgggcgct	gacctgcgct	gggccccaa	12060
ccgacgcgcc	ctggaggcag	ctggggcccg	acctgggctg	gcggtggcac	ccgcgcgcgc	12120
tggcaacgtc	ggcggcgctg	aggaatatga	cgaggacgat	gagtacgagc	cagaggacgg	12180
cgagtactaa	cggtgatgt	ttctgacag	atgatgcaag	acgcaacgga	cccggcggtg	12240
cgggcgcgcg	tgacagagcca	gccgtccggc	cttaactcca	cggacgactg	gcgccaggtc	12300
atggaccgca	tcatgtcgct	gactgcgcgc	aatcctgacg	cgttccggca	gcagccgcag	12360
gccaaccggc	tctccgcaat	tctggaagcg	gtggtcccgc	cgcgcgcaaa	ccccacgcac	12420
gagaaggctg	tgccgatcgt	aaacgcgctg	gccgaaaaca	gggccatccg	gcccgcagag	12480
gccggccttg	tctacgacgc	gctgcttcag	cgcggtggctc	gttacaacag	cggaacgtg	12540
cagaccaacc	tggaaccgct	ggtgggggat	gtgcgcgagg	ccgtggcgca	gcgtgagcgc	12600
gcgcagcagc	agggcaacct	gggtccatg	gttgactaa	acgccttctt	gagtacacag	12660
cccgcacaac	tgccgcgggg	acaggaggac	tacaccaact	ttgtgagcgc	actgcggcta	12720
atggtgactg	agacaccgca	aagtgagggt	taccagtctg	ggccagacta	ttttttccag	12780
accagtagac	aaggcctgca	gaccgtaaac	ctgagccagg	ctttcaaaaa	cttgacgggg	12840
ctgtgggggg	tgccgggctc	cacaggcgac	cgcgcgaccg	tgtctagctt	gctgacggcc	12900
aactcgcgcc	tggtgtctgt	gctaatacgc	cccttcacgg	acagtggcag	cggtgtcccg	12960
gacacatacc	taggtcactt	gctgacactg	taccgcgagg	ccataggtca	ggcgcatgtg	13020
gacgagcata	ctttccaggga	gattacaagt	gtcagccgcg	cgctggggca	ggaggacacg	13080
ggcagcctgg	aggcaaccct	aaactacctg	ctgaccaaac	ggcggcagaa	gatccccctg	13140
ttgcacagtt	taaacagcga	ggaggagcgc	atttttgcgt	acgtgcagca	gagcgtgagc	13200
cttaacctga	tgccgcgacg	ggttaacgccc	agcgtggcgc	tggaacatgac	cgcgcgcaac	13260
atggaaccgg	gcatgtatgc	ctcaaaccgg	ccgtttatca	accgcctaata	ggactacttg	13320
catcgcgcg	ccgcccgtga	ccccgagtat	ttcaccaatg	ccatcttgaa	cccgcactgg	13380
ctaccgcccc	ctgggtttcta	caccggggga	ttcgaggtgc	ccgagggtaa	cgatggattc	13440
ctctggggac	acatagacga	cagcgtgttt	tccccgcaac	cgacagacct	gctagagtgt	13500
caacagcgcg	agcaggcaga	ggcgggcgctg	cgaaaggaaa	gcttccgcag	gccaagcagc	13560
ttgtccgatc	taggcgctgc	ggcccccgcg	tcagatgcta	gtagcccat	tccaagcttg	13620
atagggtctc	ttaccagcac	tcgcaccacc	cgccccgcgc	tgctgggcga	ggaggagtac	13680
ctaaacaact	cgctgtctga	gccgcagcgc	gaaaaaaaacc	tgccctccggc	atttcccaac	13740
aacgggatag	agagcctagt	ggacaagatg	agtagatgga	agacgtacgc	gcaggagcac	13800
agggacgtgc	caggccccgcg	cccgcccacc	cgctgtcaaa	ggcacgaccg	tcagcggggt	13860
ctggtgtggg	aggacgatga	ctcggcagac	gacagcagcg	tcctggattt	gggagggagt	13920
ggcaaccctg	ttgcgcacct	tcgccccagg	ctggggagaa	tgtttttaaaa	aaaaaaaagc	13980
atggtgcaaa	ataaaaaaact	caccaaggcc	atggcaccca	gcgttggttt	tcttgtattc	14040
cccttagtat	gcggcgcgcg	gcgatgtatg	aggaaggctc	tcctccctcc	tacgagagtg	14100
tggtgagcgc	ggcgccagtg	gcggcgcgcg	tggtttctcc	cttcgatgct	cccctggacc	14160
cgccgtttgt	gcctcccgcg	tacctgcggc	ctaccggggg	gagaaacagc	atccgttact	14220
ctgagttggc	accctatttc	gacaccacc	gtgtgtacct	ggtggacaac	aagtcaacgg	14280
atgtggcatc	cctgaactac	cagaacgacc	acagcaactt	tctgaccacg	gtcattcaaa	14340
acaatgacta	cagcccgggg	gaggcaagca	cacagaccat	caatcttgac	gaccggctcg	14400
actggggcgg	cgacctgaaa	accatctctg	ataccaacat	gccaatgtg	aacgagttca	14460
tgtttaccaa	taagtttaag	gcgcgggtga	tggtgtcgcg	cttgccctact	aaggacaatc	14520
aggtggagct	gaaatacgag	tggttgaggt	tcacgctgcc	cgagggcaac	tactccgaga	14580
ccatgaccat	agaccttatg	aacaacgcga	tcgtggagca	ctacttgaaa	gtgggcagac	14640
agaacggggt	tctggaagc	gacatcgggg	taaagtttga	cacccgcaac	ttcagactgg	14700
ggtttgacct	cgctactggt	cttgtcatgc	ctgggggtata	tacaaacgaa	gccttccatc	14760
cagacatcat	tttgctgcca	ggatgcgggg	tggaactcac	ccacagccgc	ctgagcaact	14820
tggtgggcat	ccgcaacggg	caacccttcc	aggagggtct	taggatcacc	tacgatgatc	14880
tgagggggtg	taacattccc	gcactgttgg	atgtggacgc	ctaccaggcg	agcttgaaa	14940
atgacaccga	acagggcggg	ggtggcgagc	gcggcagcaa	cagcagtggc	agcggcgcg	15000

aagagaactc caacgcggca gccgcggcaa tgcagccggt ggaggacatg aacgatcatg 15060
ccatttcgcg cgacaccttt gccacacggg ctgaggagaa gcgcgctgag gccgaagcag 15120
cgggcgaagc tgcgcgcccc gctgcgcaac ccgaggtcga gaagcctcag aagaaaccgg 15180
tgatcaaaacc cctgacagag gacagcaaga aacgcagtta caacctata agcaatgaca 15240
gcaccttcac ccagtaccgc agctggtacc ttgcatacaa ctacggcgac cctcagaccg 15300
gaatccgcctc atggaccctg ctttgcactc ctgacgtaac ctgcggctcg gaggaggtct 15360
actggtcgtt gccagacatg atgcaagacc ccgtgacctt ccgctccacg cgccagatca 15420
gcaactttcc ggtggtgggc gccgagctgt tgcccggtga ctccaagagc ttctacaacg 15480
accaggccgt ctactcccaa ctcatccgcc agtttacctc tctgaccacg gtgttcaatc 15540
gctttcccga gaaccagatt ttggcgcgcc cgccagcccc caccatcacc accgtcagtg 15600
aaaacgttcc tgctctcaca gatcacggga cgctaccgct gcgcaacagc atcggaggag 15660
tccagcgagt gaccattact gacgccagac gccgcacctg ccctacgtt tacaaggccc 15720
tgggcatagt ctgcgcgcgc gtcttatcga gccgcacttt ttgagcaagc atgtccatcc 15780
ttatatcgcc cagcaataac acaggctggg gcctgcgctt cccaagcaag atgtttggcg 15840
gggccaagaa gcgctccgac caacaccagc tgcgcgtgcg cgggcactac cgcgcgccct 15900
ggggcgcgca caaacgcggc cgcaactggg gcaccaccgt cgatgacgcc atcgacgcgg 15960
tggtggagga ggcgcgcaac tacacgcccc cgccgcccac agtgtccaca gtggagcgg 16020
ccattcagac cgtggtgctg ggagcccggc gctatgctaa aatgaagaga cggcggaggc 16080
gcgtagcacg tgcgccaccg cgccgaccgc gcaactgccg ccaacgcgcg cgggcgcccc 16140
tgcttaaccg cgcaactgcg accggccgac gggcgcccat gcgggcccgt cgaaggctgg 16200
ccgcggttat tgtcactgtg cccccaggt ccaggcgacg agcgcccgcc gcagcagccc 16260
cggccattag tgctatgact cagggtcgca ggggcaacgt gtattgggtg cgcgactcgg 16320
ttagcgccct gcgcgtgccc gtgcgcaccc gccccccgcg caactagatt gcaagaaaaa 16380
actactaga ctcgactgt tgtatgtatc cagcgccggc ggcgcgcaac gaagctatgt 16440
ccaagcgcaa aatcaaaaga gagatgctc aggtcatcgc gccggagatc tatggccccc 16500
cgaagaagga agagcagat tacaagcccc gaaagctaaa gcgggtcaaa aagaaaaaga 16560
aagatgatga tgatgaactt gacgacgagg tggaaactgt gcacgtacc gcgccaggc 16620
gacgggtaca gtggaaaggt cgacgcgtaa aacgtgttt gcgacccggc accaccgtag 16680
tctttacgcc cgtgagcgc tccaccgcga cctacaagcg cgtgtatgat gagggtgacg 16740
gcgagagga cctgcttgag caggccaacg agcgccctcg ggaagtttcc tacggaagac 16800
ggcataagga catgctggcg ttgcgctgg acgagggcaa cccaacacct agcctaaagc 16860
ccgtaacact gcagcagtg ctgcccgcgc ttgcaccgtc cgaagaaaag cgcgccctaa 16920
agcgcgagtc tggtagcttg gcacccaccg tgcagctgat ggtacccaag cgccagcgac 16980
tggaagatgt cttggaaaaa atgaccgtgg aacctgggct ggaagccgag gtccgctgc 17040
ggccaatcaa gcaggtggcg ccgggactgg gcgtgcagac cgtggacgtt cagataccca 17100
ctaccagtag caccagtatt gccaccgcca cagaggcgat ggagacacaa acgtcccccg 17160
ttgcctcage ggtggcggat gccgcggtgc aggcggtcgc tgcggcccg tccaagacct 17220
ctacggaggt gcaaacggac ccgtggatgt ttgcgcttcc agcccccg cgcccgctgc 17280
gttcgaggaa gtacggcgcc gccagcgcg tactgcccga atatgcccta cacccttcca 17340
ttgcgcctac ccccgctat cgtggctaca cctaccgccc cagaagacga gcaactacct 17400
gacgcggaac caccactgga acccgccgccc gccgtcgccg tgcagagccc gtgctggccc 17460
cgatttccgt gcgcagggtg gctcgcgagg gaggcaggac cctggtgctg ccaacagcgc 17520
gctaccaccc cagcatcggt taaaagccgg tctttgtggt tcttgagat atggccctca 17580
cctgcccct cgttttcccg gtgcccggat tccgaggaag aatgcaccgt aggaggggca 17640
tggccggcca cgccctgacg ggccgcatgc gtcgtgcgca ccaccggcg cgcgcgcgct 17700
cgccacgtcg catgcgcgcc ggtatccctg cctccttat tccactgat gcccgggcga 17760
ttggcgccgt gcccggaatt gcatccgtgg ccttgcaagg gcagagacac tgattaaaaa 17820
caagttgcat gtggaaaaat caaaataaaa agtctggact ctcacgctcg cttggtctcg 17880
taactatttt gtgaatgga agacatcaac tttgcgtctc tggcccccg acacggctcg 17940
cgcccggtta tgggaaactg gcaagatatc ggcaccagca atatgagcgg tggcgcttc 18000
agctggggct cgctgtggag cgccattaaa aatttcggtt ccaccgttaa gaactatggc 18060
agcaaggcct ggaacagcag cacaggccag atgctgagg ataagttgaa agagcaaaaat 18120
ttccaacaaa aggtggtaga tggcctggcc tctggcata gcggggtggt ggacctggcc 18180
aaccagcgag tgcaaaaata gattaacagt aagcttgatc cccgcccctc cgtagaggag 18240
cctccaccgg ccgtggagac agtgcttcca gaggggcggt gcgaaaagcg tccgcgcccc 18300
gacagggaag aaactctggt gacgcaata gacgagcctc cctcgtagca ggaggcacta 18360
aagcaaggcc tgcccaccac ccgtcccatc gcgcccagtg ctaccggagt gctgggcccag 18420
cacacacccg taacgctgga cctgcctccc cccgcccaga ccagcagaa acctgtgctg 18480
ccaggccccg ccgcccgtgt tgtaaccctg cctagccgcg cgtccctgcg ccgcccgcgc 18540
agcggtccgc gatcggtgag gcccgtagcc agtggcaact ggcaaaagc actgaacagc 18600
atcggtgggtc tgggggtgca atccctgaag gcggcagcat gcttctgaat agctaactgt 18660
tcgtatgtgt gtcattgtat cgtccatgtc gccgccagag gactgtgta gccgccgcgc 18720
gcccgtttc caagatggct accccttcga tgatgccgca gtggtcttac atgcacatct 18780
cgggccagga cgccctggag tacctgagcc ccgggctggg gcagtttgcc cgcgccacgc 18840
agacgtactt cagcctgaat aacaagttaa gaaacccac ggtggcgctt acgcacgacg 18900
tgaccacaga ccggtcccag cgtttgacgc tgcggttcat ccctgtggac cgtgaggata 18960

ctgctgactc gtacaaggcg cggttcaccc tagctgtggg tgataaccgt gtgctggaca 19020
 tggctttccac gtacttttgac atccgcggcg tgctggacag gggccctact ttttaagccct 19080
 actctggcac tgcctacaac gccctggctc ccaagggtgc cccaaatcct tgcgaatggg 19140
 atgaagctgc tactgtctctt gaaataaacc tagaagaaga ggacgatgac aacgaagacg 19200
 aagtagacga gcaagctgag cagcaaaaaa ctcacgtatt tgggcaggcg ccttattctg 19260
 gtataaatat tacaaggag ggtattcaaa taggtgtcga aggtcaaaca cctaaatatg 19320
 ccgataaaaac atttcaacct gaacctcaaa taggagaatc tcagtggtag gaaactgaaa 19380
 ttaatcatgc agctgggaga gtccttaaaa agactacccc aatgaaacca tgttacggtt 19440
 catatgcaaa acccacaat gaaaatggag ggcaaggcat tcttgtaaag caacaaaatg 19500
 gaaagctaga aagtcaagt gaaatgcaat ttttctcaac tactgaggcg accgcaggca 19560
 atggtgataa cttgactcct aaagtggat tgtacagtga agatgtagat atagaaaccc 19620
 cagacactca ttttcttac atgcccacta ttaaggaagg taactcacga gaactaatgg 19680
 gccacaatc tatgcccaac aggcctaatt acattgcttt tagggacaat ttatttggtc 19740
 taatgtatta caacagcacg ggtaatatgg gtgttctggc ggccaagca tcgcagttag 19800
 atgctgttgt agatttgcaa gacagaaaca cagagctttc ataccagctt ttgcttgatt 19860
 ccattgttgc tagaaccagg tacttttcta tgggaatca ggctgttgac agctatgatc 19920
 cagatgttag aattattgaa aatcatggaa ctgaagatga acttccaaat tactgcttct 19980
 cactgggagg tgtgattaat acagagactc ttaccaaggt aaaacctaaa acaggtcagg 20040
 aaaatggatg gaaaaaagat gctacagaat tttcagataa aaatgaaata agagttggaa 20100
 ataattttgc catggaaatc aatctaaatg ccaacctgtg gagaaatttc ctgtactcca 20160
 acatagcgct gtatttgccc gacaagctaa agtacagtcc ttccaacgta aaaatttctg 20220
 ataaccctaaa cactacgac tacatgaaca agcagtggtt ggctcccggg ttagtggtact 20280
 gctacattaa ccttgagca cgtgtgtccc ttgactatat ggacaacgct aacccattta 20340
 accaccaccg caatgctggc ctgcgtacc gctcaatgtt gctgggcaat ggtcgtatg 20400
 tgcccttcca catccaggtt cctcagaagt tctttgcat taaaaacctc cttctcctgc 20460
 cgggctcata cacctacgag tggaaactca ggaaggatgt taacatggtt ctgcagagct 20520
 ccctaggaat tgacctagg gttgacggag ccagcattaa gtttgatagc atttgcttt 20580
 acgccacctt ctccccatg gccacaaca ccgctccac gcttgaggcc atgcttagaa 20640
 acgacaccaa cgaccagtcc tttaacgact atctctccgc cgccaacatg ctctacccta 20700
 taccgcctaa cgctaccaac gtgcccata ccatccctc ccgcaactgg gcggctttcc 20760
 gcggctgggc cttcacgct ctttaagacta aggaaccccc atcactgggc tcgggctacg 20820
 acccttatta cacctactct ggctctatac cctacctaga tggaaacctt tacctcaacc 20880
 acacctttaa gaaggtggcc attacctttg actcttctgt cagctggcct ggcaatgacc 20940
 gcctgcttac ccccaacgag tttgaaatta agcgtcagt tgacggggag ggttacaacg 21000
 ttgcccagtg taacatgacc aaagactggt tcctgggtaca aatgctagct aactacaaca 21060
 ttggctacca gggcttctat atcccagaga gctacaagga ccgcatgtac tccttcttta 21120
 gaaacttcca gccatgagc cgtcagggtg tggatgatac taaatacaag gactaccaac 21180
 aggtgggcat cctacaccaa cacaacaact ctggatttgt tggctacctt gccccacca 21240
 tgcgcgaagg acaggcctac cctgctaact tcccctatcc gcttataggc aagaccgag 21300
 ttgacagcat taccagaaa agtttcttt gcgatcgac cctttggcgc atccccattt 21360
 ccagtaactt tatgtccatg ggcgactca cagacctggg ccaaaacctt ctctacgcca 21420
 actccgcca cgcgctagac atgacttttg agtggtatcc catggacgag cccaccttc 21480
 tttatgtttt gtttgaagtc tttgacgtgg tccgtgtgca ccggccgcac cgcggcgta 21540
 tcgaaaccgt gtacctgcy acgcccctt cgcggcgcaa cgccacaaca taaagaagca 21600
 agcaaatca acaacagctg ccgcatggg ctcagtgag caggaactga aagccattgt 21660
 caaagatctt ggtgtgggc catattttt ggccacctat gacaagcgct ttccaggctt 21720
 tgtttctcca cacaagctcg cctgcgcat agtcaatag gccggtcgag agactggggg 21780
 cgtacactgg atggccttg cctggaaccc gactcaaaa acatgctacc tctttgagcc 21840
 ctttggttt tctgaccagc gactcaagca ggtttaccag tttgagtac agtcaactct 21900
 gcgcgtagc gccattgctt cttccccga ccgctgtata acgctgaaa agtccacca 21960
 aagcgtagc gggcccaact cggccgctg tggactattc tgctgcatgt ttctccacgc 22020
 ctttgccaac tggcccaaaa ctcccatgga tcacaacccc accatgaacc ttattaccgg 22080
 ggtacccaac tccatgctca acagtcccca ggtacagccc accctgcgtc gcaaccagga 22140
 acagctctac agcttctctg agcgccactc gccctacttc cgcagccaca gtgcgcagat 22200
 taggagcgcc acttctttt gtcaactgaa aaacatgtaa aaataatgta ctagagacac 22260
 tttcaataaa ggcaaatgct tttatttgta cactctcggg tgattattta cccccacct 22320
 tgccgtctgc gccgtttaaa aatcaaagg gttctgccc gcactcgctat gcgccaactg 22380
 cagggacacg ttgcgatact ggtgtttagt gctccactta aactcaggca caaccatccg 22440
 cggcagctcg gtgaagtgtt cactccacag gctgcgcacc atcaccaacg cgttagagcag 22500
 gtcggggccc gatatttga agtcgcagt ggggcctccg cctgcgcgc gcgagttgcg 22560
 atacacagg ttgcagcact ggaacactat cagcgccggg tgggtcacgc tggccagcac 22620
 gctcttgcg gagatcagat ccgctgccag gtcctccgcg ttgctcagg cgaacggagt 22680
 caactttgtt agctgccttc ccaaaaagg cgcgtgcca ggctttgagt tgcactcgca 22740
 ccgtagtgcc atcaaaagg gaccgtgccc ggtctgggcy ttaggataca gcgctgcat 22800
 aaaagcctt atctgcttaa aagccacctg agcctttgcg cttcagaga agaactgac 22860
 gcaagactt ccggaaaact gattggccgg acaggccgcg tcgtgcacgc agcaccttgc 22920

gtccggtgtg gagatctgca ccacatttcg gccccaccgg ttcttcacga tcttggcctt 22980
 gctagactgc tccttcagcg cgcgctgccc gtttttcgctc gtcacatcca tttcaatcac 23040
 gtgctcctta ttfatcataa tgcttcctgt tagacactta agctcgctt cgatctcagc 23100
 gcagcggtgc agccacaacg cgcagcccggt gggctcgtga tgcttgtagg tcacctctgc 23160
 aaacgactgc aggtacgcct gcaggaatcg ccccatcatc gtcacaaagg tcttgtgtgt 23220
 ggtgaagggtc agctgcaacc cgcggtgctc ctcggtcagc caggctctgc atacggccgc 23280
 cagagcttcc acttgggtcag gcagtagttt gaagttcgcc tttagatcgt tatccacgtg 23340
 gtacttgtcc atcagcgcg cgcgagcctc catgcccttc tcccacgcag acacgatcgg 23400
 cacactcagc gggttcatca ccgtaatttc actttccgct tcgctgggct ctctctcttc 23460
 ctcttgcgtc cgcataccac gcgccactgg gtcgtcttca ttcagccgcc gcactgtgcg 23520
 cttacctcct ttgccatgct tgattagcac cgggtgggtt ctgaaaccca ccattttag 23580
 cgccacatct tctctttctt cctcgctgtc cagcattacc tctggtgatg gcgggcgctc 23640
 gggcttggga gaaggcgct tcttttctt ctggggcgca atggccaaat ccgcccgcga 23700
 ggtcgatggc cgcgggctgg gtgtgcgcgg caccagcgcg tcttgtgatg agtcttctc 23760
 gtcctcggag tcgatacgcc gcctcatcgg cttttttggg ggcccccggg gaggcggcg 23820
 cgacggggac ggggacgaca cgtcctccat ggttggggga cgtcgcgccg caccgcgtcc 23880
 gcgctcgggg gtggtttcgc gctgctcctc tcccgcactg gccatttcct tctcctatag 23940
 gcagaaaaag atcatggagt cagtcgagaa gaaggacagc ctaaccgccc cctctgagtt 24000
 cgccaccacc gcctccaccg atggccgcaa cgcgcctacc accttcccgc tcgaggcacc 24060
 cccgcttgag gaggaggaa tgattatcga gcaggaccca ggtttttaa gcgaagacga 24120
 cgaggaccgc tcagtaccaa cagaggataa aaagcaagac caggacaacg cagaggcaaa 24180
 cgaggaaaca gtccggcggg gggacgaaag gcatggcgac tacctagatg tgggagacga 24240
 cgtgctgttg aagcatctgc agcgccagtgc cgccattatc tgcgacgcgt tgcaagagcg 24300
 cagcgatgtg cccctcgcca tagcggatgt cagccttgcc tacgaacgcc acctattctc 24360
 accgcgctga ccccccaaac gccaaagaaa cggcacatgc gagcccaacc cgcgcctcaa 24420
 cttctacccc gtatttgccg tgcagagggt gcttgccacc tatcacatct ttttccaaaa 24480
 ctgcaagata cccctatcct gccgtgcaa cccgagccga gcggacaagc agctggcctt 24540
 gcggcagggc gctgtcatac ctgatatcgc ctgctcaac gaagtgcgaa aaatcttga 24600
 gggctctgga cgcgacgaga agcgcgcggc aaacgctctg caacaggaaa acagcgaaaa 24660
 tgaaagtcac tctggagtgt tgggtgaaact cgagggtgac aacgcgcgcc tagccgtact 24720
 aaaacgcagc atcgaggta cccactttgc ctaccgcgca cttaacctac cccccaaggt 24780
 catgagcaca gtcagtagtg agctgatcgt gcgcctgctg cagcccctgg agagggatgc 24840
 aaatttgcaa gaacaaacag aggagggcct acccgagtt ggcgacgagc agctagcgcg 24900
 ctggcttcaa acgcgcgagc ctgccgactt ggaggagcga cgcaactaa tgatggccgc 24960
 agtgctcgtt accgtggagc ttgagtgcat gcagcggttc tttgctgacc cggagatgca 25020
 gcgcaagcta gaggaaacat tgcactacac ctttcgacag ggctacgtac gccaggcctg 25080
 caagatctcc aacgtggagc tctgcaacct ggtctcctac cttggaattt tgcaagaaaa 25140
 ccgccttggg caaaacgtgc ttcattccac gctcaagggc gagggcgccc gcgactacgt 25200
 ccgcgactgc gtttacttat ttctatgcta cacttgccag acggccatgg cgttttgca 25260
 gcagtgcttg gaggagtga acctcaagga gctgcagaaa ctgctaaagc aaaacttgaa 25320
 ggacctatgg acggccttca acgagcgctc cgtggccgag cacttgccgg acatcattt 25380
 ccccgaaacgc ctgcttaaaa ccctgcaaca gggcttgcca gacttcacca gtcaaagcat 25440
 gttgcagaac tttaggaaact ttatcctaga gcgctcagga atcttgccc ccaactgctg 25500
 tgcacttctc agcgactttg tgccatttaa gtaccgcgaa tgccctccgc cgttttggg 25560
 ccactgctac cttctgcagc tagcctaact ccttgccctac cactctgaca taatggaaga 25620
 cgtgagcggt gacggtctac tggagtgtca ctgtcgtgc aacctatgca ccccgaccg 25680
 ctccctggtt tgcaattcgc agctgcttaa cgaaagtcaa attatcggtc cctttgagct 25740
 gcagggtccc tcgcctgacg aaaagtccgc ggtccgggg ttgaaactca ctccggggt 25800
 gtggacgtcg gcttaccttc gcaaatttgt acctgaggac taccacgccc acgagattag 25860
 gttctacgaa gaccaatccc gcccgcaaaa tgcggagctt accgcctgcg tcattaccca 25920
 gggccacatt cttggccaat tgcaagccat caacaaagcc cgccaagagt ttctgctacg 25980
 aaaggagcgg ggggtttact tggaccccca gtccgcgag gagctcaacc caatcccccc 26040
 gccgcccag ccctatcagc agcagcccg ggccttgcct tcccaggatg gcacccaaaa 26100
 agaagctgca gctgcccgg ccacccacgg acgaggagga atactgggac agtcaggcag 26160
 aggaggtttt ggacgaggag gaggaggaca tgatggaaga ctgggagagc ctgacagagg 26220
 aagcttccga ggtcgaagag gtgtcagacg aaacaccgtc acctcggtc gcattcccct 26280
 cgccgcgccc ccagaaatcg gcaaccggtt ccagcatggc tacaacctcc gctcctcagg 26340
 cgccgcccgc actgcccgtt cgccgaccca accgtagatg ggacaccact ggaaccaggg 26400
 ccggtaaagt caagcagcg ccgcccgttag cccaagagca acaacagcgc caaggctacc 26460
 gctcatggcg ggggcacaag aacgccatag ttgcttgctt gcaagactgt gggggcaaca 26520
 tctccttcgc ccgcccctt cttctctacc atcacggcgt ggccttcccc cgtaacatcc 26580
 tgcattacta ccgtcatctc tacagcccat actgcaccgg cggcagcggc agcgcgagca 26640
 acagcagcgg ccacacagaa gcaaaggcga ccgtagagca agactctgac aaagccaaag 26700
 aaatccacag cggcgagcgc agcagaggga ggagcgctgc gtctggcgcc caacgaaccc 26760
 gtatcgaccc gcgagcttag aaacaggatt tttccactc tgtatgctat atttcaacag 26820
 agcagggggc aagaacaaga gctgaaaata aaaaacaggt ctctgcgac cctcaccgcg 26880

```

agctgcctgt atcacaaaag cgaagatcag cttcggcgca cgctggaaga cgcgagggct 26940
ctcttcagta aatactgcgc gctgactctt aaggactagt ttcgcgcctt ttctcaaat 27000
taagcgcgaa aactacgtca tctccagcgg ccacaccgg cgccagcacc tgctcgtcagc 27060
gccattatga gcaaggaaat tcccacgccc tacatgtgga gttaccagcc acaaatggga 27120
cttgcggctg gagctgcccc agactactca acccgataa actacatgag cgcggggaccc 27180
cacatgatat ccggggtcaa cggaatccgc gccaccgaa accgaattct cttggaacag 27240
gcggtctatta ccaccacacc tcgtaataac cttaatcccc gtagttggcc cgctgccttg 27300
gtgtaccagg aaagtcccg tcccaccact gtggtacttc ccagagacgc ccaggccgaa 27360
gttcagatga ctaactcagg ggcgcagctt gcgggcggtt ttcgtcacag ggtgcggtcg 27420
ccccggcagg gtataactca cctgacaatc agagggcgag gtattcagct caacgacgag 27480
tcggtgagct cctcgcttg tctccgtccg gacgggacat ttcagatcgg cgcgccggcg 27540
cgctcttcac tcacgcctcg tcaggcaatc ctaactctgc agacctcgtc ctctgagccg 27600
cgctctggag gcattggaa cttgcaattt attgaggagt ttgtgccatc ggtctacttt 27660
aaccctctct cgggacctcc cgccactat ccggatcaat ttattcctaa ctttgacgcg 27720
gtaaaggact cgcgggacgg ctacgactga atgttaagt gagaggcaga gcaactgcgc 27780
ctgaaacacc tgggtccactg tcgccgccac aagtgtttg cccgcgactc cggtgagttt 27840
tgctactttg aattggccga ggtcatatc gagggcccg gcacggcggt ccggttacc 27900
gccaggagg agcttgccc tagcctgatt cggtgagttt cccagcgccc cctgctagtt 27960
gagcgggaca ggggacctg tttctcact gtgatttgca actgtcctaa ccttgatta 28020
catcaagatc tttgttgcca tctctgtgct gattataata aatacagaaa ttaaaatata 28080
ctggggctcc tatcgccatc ctgtaaacgc caccgtcttc acccgccaa gcaaaacca 28140
gcgaacctta cctggtaact ttaacatctc tccctctgtg atttacaaca gtttcaacc 28200
agacggagtg agtctacgag agaacctctc cgagctcagc tactccatca gaaaaaacac 28260
caccctctct acctgcccgg aacgtacgag tgcgtcaccc gccgctgcac cacacctacc 28320
gcctgaccgt aaaccagact tttccggac agacctcaat aactctgttt accagaacag 28380
gaggtgagct tagaaaaacc ttaggtatt aggcgaagg cgagctact gtggggttta 28440
tgaacaattc aagcaactct acgggtatt ctaattcagg tttctctagg gttggggtta 28500
ttctctgtct tgtgattctc ttattctta tactaacgct tctctgccta aggtcgcgg 28560
cctgctgtgt gcacatttgc atttattgtc agctttttaa acgctggggg cgccacccaa 28620
gatgattagg tacataatc taggtttact cacccttgcg tcagcccacg gtacttaatt 28680
aaccctaaag gtggatttta aggagccagc ctgtaattgt acattcgagc ctgaagctaa 28740
tgagtgcacc actcttataa aatgcaccac agaactgaa aagctgctta ttcgcccaa 28800
aaacaaaatt ggcaagtatg ctgtttatgc tatttgagc ccagggtgaca ctacagagta 28860
taatgttaca gttttccagg gtaaaagta taaaacttt atgtataact ttccatttta 28920
tgaaatgtgc gacattacca tgtacatgag caaacagat aagttgtggc ccccaaaaa 28980
ttgtgtggaa aacactggca cttctgtctg cactgctatg ctaattacag tgctcgcttt 29040
gggtctgtacc ctactctata ttaatacaaa aagcagacgc agctttattg aggaaaagaa 29100
aatgccttaa tttactaagt tacaagcta atgtcaccac taactgcttt actcgtgct 29160
tgcaaaaaca attcaaaaag tttagcattat aattagaata ggatttaaac ccccggtga 29220
tttctgtctc aataccattc ccctgaacaa ttgactctat gtgggatatg ctccagcgct 29280
acaacctga agtcaggctt cctggatgtc agcatctgac tttggccagc acctgtccc 29340
cggatttgtt ccagtcacac tacagcgacc caccctaaca gagatgacca acacaacca 29400
cgcgcccgcc gctaccggac ttacatctac cacaataaca cccaagtgt ctgcctttgt 29460
caataactgg gataacttgg gcatgtgtg gttctccata gcgcttatgt ttgtatgct 29520
tattattatg tggctcatct gctgcctaaa gcgcaaacgc gcccgaccac ccactctatg 29580
tcccattatt gtgctacacc caaacaatga tggatccat agattggacg gactgaaaca 29640
catgttcttt tctcttacag tatgattaaa tgagacatga ttcctcagat ttttatatta 29700
ctgacccttg ttgcgctttt ttgtgcgtgc tccacattgg ctgcggtttc tcacatcgaa 29760
gtagactgca ttccagcctt cacagtctat ttgctttaag gatttgcac cctcacgctc 29820
atctgcagcc tcatactgt ggtcatcgcc tttatccagt gcattgactg ggtctgtgtg 29880
cgctttgcat atctcagctg ctgcatgtt gtgtgtgtac catgttgttt tcatgtgtt 29940
ctgcatgtct cttgtgcct tagatctctc tttatgtagt gttgtgtgt ctctctgtc 30000
gtgatgtgtg tttgttctta tatattttaa tttttaatcc aaacctctgt ccccgagag 30060
gcctttgcgt tctggtaggc cgtcattgaa aactgactta actcgttaaa ttaaaaaaat 30120
gtaaaaata atggttgaga ctacgcccac catcggcaga tgaggtggat tgagactcag 30180
cccaacatcg gcagatgagg tggattgaga ctcatgagg tggatgagg gcccgacgct cacaggtggg 30240
ttagatgagg tggattgaga ctcatgagg tggatgagg gcccgacgct cacaggtggg 30300
agttgtgctt tacagtccaa cgtgcaggac gcttggcatt tgccagagaa caccagatt 30360
ggcaaatcgc caactggcgc cctgtgctct tcacagacgg aaaaatgacc aaaatctgat 30420
tatttttgta aaacggaaac cgaatgtccg acaaagtcca tttgatgact tcccgtagg 30480
tctgccctgc cgctgggccc acgcggtccg ggaattttac aaacgatttc ggacgtctag 30540
cattcactca cctgttcaag gacctgagga tctctgcacc cttattaaga cctgtgcgg 30600
tctcaagat cttattccct ttaactaata aaaaaaata ataaagcatc acttacttaa 30660
aatcagttag caaatttctg tccagtttat tcagcagcac ctcttgccc tctctccagc 30720
ctgtgtatg cagcttctc ctgggtgcaa acttctcca caatctaaat ggaatgtcag 30780
ttctctctg ttctgttcca tccgcaccca ctatcttcat gttgttgag atgaagcgcg 30840

```

caagaccgtc	tgaagatacc	ttcaaccccg	tgtatccata	tgacacggaa	accggtcctc	30900
caactgtgcc	ttttcttact	cctcccttgg	tatcccccaa	tggtgttcaa	gagagtcccc	30960
ctgggggtact	ctcttttgcgc	ctatccgaac	ctctagttag	ctccaatggc	atgcttgcgc	31020
tcaaaatggg	caacggcctc	tctctggacg	aggccggcaa	ccttacctcc	caaaatgtaa	31080
ccactgtgag	cccacctctc	aaaaaaacca	agtcaaacat	aaacctggaa	atatctgcac	31140
ccctcacagt	tacctcagaa	gccctaactg	tggtgtccgc	cgcacctcta	atgggtcgcg	31200
gcaacacact	caccatgcaa	tcacaggccc	cgctaaccgt	gcacgactcc	aaacttagca	31260
ttgccaccca	aggacccttc	acagtgtcag	aaggaaaagt	agccctgcaa	acatcaggcc	31320
ccctcaccac	caccgatagc	agtaccctta	ctatcactgc	ctcacccttc	ctaactactg	31380
ccactggtag	cttgggcatt	gacttgaaag	agccccatta	tacacaaaat	ggaaaactag	31440
gactaaagta	cggggtcctt	ttgcatgtaa	cagacgacct	aaacactttg	accgtagcaa	31500
ctgggtccagg	tgtgactatt	aataataactt	ccttgcaaac	taaagttagt	ggagccttgg	31560
gttttgattc	acaaggcaat	atgcaactta	atgtagcagg	aggactaagg	attgattctc	31620
aaaacagacg	ccttataactt	gatgttagtt	atccgtttga	tgctcaaaac	caactaaatc	31680
taagactagg	acagggccct	ctttttataa	actcagccca	caacttggat	attaactaca	31740
acaaaggcct	ttactttgtt	acagcttcaa	acaattccaa	aaagcttgag	gttaacctaa	31800
gcactgccaa	gggtttgatg	tttgacgcta	cagccatagc	cattaatgca	ggagatgggc	31860
ttgaatttgg	ttcacctaata	gcaccaaaca	caaataccct	caaaacaaaa	attggccatg	31920
gcctagaatt	tgattcaaac	aaggctatgg	ttcctaact	aggaactggc	cttagttttg	31980
acagcacagg	tgccattaca	gtaggaaaca	aaaataatga	taagtaact	ttgtggacca	32040
caccagctcc	atctcctaac	tgtagactaa	atgcagagaa	agatgctaaa	ctcactttgg	32100
tcttaacaaa	atgtggcagt	caaatacttg	ctacagtttc	agttttggct	gttaaaggca	32160
gtttggctcc	aatatctgga	acagttcaaa	gtgctcatct	tattataaga	tttgacgaaa	32220
atggagtgtc	actaaacaat	tccttctctg	acccagaata	ttggaacttt	agaaatggag	32280
atcttactga	aggcacagcc	tatacaaacg	ctgttggtat	tatgcctaac	ctatcagctt	32340
atccaaaatc	tcacggtaaa	actgccaaaa	gtaacattgt	cagtcaagtt	tacttaaacg	32400
gagacaaaac	taaacctgta	acactaacca	ttactactaa	cggtacacag	gaaacaggag	32460
acacaaactc	aagtgcatac	tctatgtcat	tttcatggga	ctggtctggc	cacaactaca	32520
ttaatgaaat	atttgccaca	tcctcttaca	ctttttcata	cattgcccaa	gaataaaagaa	32580
tcgtttgtgt	tatgtttcaa	cgtgtttatt	tttcaattgc	agaaaatttc	aagtcatttt	32640
tcattcagta	gtatagcccc	accaccacat	agcttatata	gatcaccgta	ccttaataca	32700
actcacagaa	ccctagtatt	caacctgcca	cctccctccc	aacacacaga	gtacacagtc	32760
ctttctcccc	ggctggcctt	aaaaagcatc	atatcatggg	taacagacat	attcttaggt	32820
gtttattctc	acacggtttc	ctgtcgagcc	aaacgctcat	cagtgatatt	aataaactcc	32880
ccgggcagct	cacttaagtt	catgtcgctg	tccagctgct	gagccacagg	ctgctgtcca	32940
acttgcggtt	gcttaacggg	cggcgaagga	gaagtccacg	cctacatggg	ggtagagtca	33000
taatcgtgca	tcaggatagg	gcggtggtgc	tgcagcagcg	cgcgaaataa	ctgctgccgc	33060
cgccgctccg	tcctgcagga	atacaacatg	gcagtgttct	cctcagcgat	gattcgcacc	33120
gcccgcagca	taaggcgctt	tgctctccgg	gcacagcagc	gcaccctgat	ctcacttaaa	33180
tcagcacagt	aactgcagca	cagcaccaca	atattgttca	aaatcccaca	gtgcaaggcg	33240
ctgtatccaa	agctcatggc	ggggaccaca	gaacccacgt	ggccatcata	ccacaagcgc	33300
aggtagatta	agtggcgacc	cctcataaac	acgttggaac	taaacattac	ctcttttggc	33360
atgtttgtaat	tcaccacctc	ccggtaccat	ataaacctct	gattaaacat	ggcgccatcc	33420
accaccatcc	taaaccagct	ggccaaaacc	tgcccgccgg	ctatacactg	cagggaaccg	33480
ggactggaac	aatgacagtg	gagagccag	gactcgtaac	catggatcat	catgtctgtc	33540
atgatatcaa	tgttggcaca	acacaggcac	acgtgcatac	acttcctcag	gattacaagc	33600
tcctcccgcg	ttagaaccat	atcccaggga	acaacccatt	cctgaatcag	cgtaaatccc	33660
acactgcagg	gaagacctcg	cacgttaactc	acgttgtgca	ttgtcaaagt	gttacattcg	33720
ggcagcagcg	gatgatcctc	cagtatggta	gcgcgggttt	ctgtctcaaa	aggaggtaga	33780
cgatccctac	tgtagggagt	gcgcgagac	aaccgagatc	gtgttggtcg	tagtgtcatg	33840
ccaaatggaa	cgccggacgt	agtcataatt	cctgaagcaa	aaccaggtgc	ggcggtgaca	33900
aacagatctg	cgtctccggt	ctcgccgctt	agatcgctct	gtgtagtagt	tgtagtatat	33960
ccactctctc	aaagcatcca	ggcgccccct	ggcttcgggt	tctatgtaaa	ctccttcatg	34020
cgccgctgcc	ctgataacat	ccaccaccgc	agaataagcc	acaccagacc	aacctacaca	34080
ttcgtttctgc	gagtcacaca	cgggaggagc	gggaagagct	ggaagaacca	tgtttttttt	34140
ttttattccaa	aagattatcc	aaaacctcaa	aatgaagatc	tattaagtga	acgcgctccc	34200
ctccggtggc	gtggtcaaac	tctacagcca	aagaacagat	aatggcattt	gtaagatgtt	34260
gcacaatggc	ttccaaaagg	caaacggccc	tcacgtccaa	gtggacgtaa	aggctaaacc	34320
cttcagggtg	aatctcctct	ataaacattc	cagcaccttc	aacctatgcc	aaataattct	34380
catctcgcca	ccttctcaat	atatctctaa	gcaaatcccg	aatattaagt	ccggccattg	34440
taaaaatctg	ctccagagcg	ccctccacct	tcagcctcaa	gcagcgaatc	atgattgcaa	34500
aaattcaggt	tcctcacaga	cctgtataag	attcaaaagc	ggaacattaa	caaaaatacc	34560
gcgatcccg	aggtcccttc	gcagggccag	ctgaacataa	tcgtgcaggt	ctgcacggag	34620
cagcgcggcc	acttcccgcg	caggaaacct	gacaaaagaa	cccacactga	ttatgacacg	34680
catactcgga	gctatgctaa	ccagcgtagc	cccgatgtaa	gctttgttgc	atgggcggcg	34740
atataaaatg	caaggtgctg	ctcaaaaaat	caggcaaaagc	ctcgcgcaaa	aaagaaagca	34800

```

catcgtagtc atgctcatgc agataaaggc aggtaagctc cggaccacc acagaaaaag 34860
acaccatttt tctctcaaac atgtctgcgg gtttctgcat aaacacaaaa taaaataaca 34920
aaaaaacatt taacatttag aagcctgtct tacaacagga aaacaacccc ttataagcat 34980
aagacggact acggccatgc cggcgtgacc gtaaaaaaac tggtcaccgt gattaaaaag 35040
caccaccgac agctcctcgg tcatgtccgg agtcataatg taagactcgg taaacacatc 35100
aggttgattc atcgggtcagt gctaaaaaag caccgaaata gcccggggga atacataccc 35160
gcaggcgtag agacaacatt acagccccc a taggaggat aacaaaatta ataggagaga 35220
aaaaacacata aacacctgaa aaacctcct gcctaggcaa aatagcacc tcccgctcca 35280
gaacaacata cagcgcttca cagcggcagc ctaacagtca gccttaccag taaaaaagaa 35340
aacctattaa aaaaacacca ctgcacacgg caccagctca atcagtcaca gtgtaaaaaa 35400
gggccaagtg cagagcgagt atatatagga ctaaaaaatg acgtaacggt taaagtccac 35460
aaaaaacacc cagaaaaccg cagcgaacc tacgcccaga aacgaaagcc aaaaaacca 35520
caacttcctc aaatcgtcac ttccgttttc ccacgttacg taacttccca tttaagaaa 35580
actacaattc ccaacacata caagttaact cgccctaaaa cctacgtcac ccgccccgtt 35640
cccacgcccc gcgcacgctc acaaaactcca cccctcatt atcatattgg cttcaatcca 35700
aaataaggta tattattgat gatg

```

<210> 14

<211> 33988

<212> DNA

<213> Adenovirus subgroup C

<400> 14

```

catcatcaat aatatacctt attttgatt gaagccaata tgataatgag ggggtggagt 60
ttgtgacgtg gcgcggggcg tgggaacggg gcgggtgacg tagtagtgtg gcggaagtgt 120
gatgttgcaa gtgtggcgga acacatgtaa gcgacggatg tggcaaaagt gacgtttttg 180
gtgtgcccgg gtgtacacag gaagtacaaa ttttcgcgcg gttttaggcg gatgttgtag 240
taaatttggg cgtaaccgag taagatttgg ccattttcgc gggaaaactg aataagagga 300
agtgaatctt gaataatttt gtgttactca tagcgcgtaa tattgtcta gggccgcg 360
gactttgacc gtttacgtgg agactcgccc aggtgttttt ctcaggtgtt ttccgcttc 420
cgggtcaaaag ttggcgtttt attattatag tcagctgacg ttagtgttat ttataccc 480
tgagtctctc aagaggccac tcttgagtgc cagcgagtag agttttctcc tccgagccgc 540
tccgacacgg ggactgaaaa tgagacatga ggtactggct gataatcttc cactcctag 600
ccattttgaa ccacctaccc ttcacgaact gtatgattta gacgtgacgg ccccgagga 660
tcccacagag gaggcggttt cgcagatttt tcccgaactc gtaatgttgg cgggtgcagga 720
agggattgac ttactcactt ttccgcccgc gcccggttct cggagaccgc ctcaccttc 780
ccgagcagccc gagcagcccg agcagagagc ctgggtccg gtttgccacg aggttggt 840
tccacccagt gacgacgagg atgaagaggg tgaggagtgt gtgttagatt atgtggagca 900
ccccgggcac gggtgcaggt cttgtcatta tcaccggagg aatacggggg acccagatat 960
tatgtgttcg ctttgctata tgaggacctg tggcatgttt gtctacagta agtgaaaatt 1020
atgggcagtg ggtgatagag tgggtgggtt ggtgtggtaa tttttttttt aatttttaca 1080
gttttggtgt ttaaagaatt ttgtatttgg atttttttta aaggtcctgt gtctgaacct 1140
gagcctgagc ccgagccaga accggagcct gcaagacctt cccgcccgtc taaaatggcg 1200
cctgctatcc tgagacgccc gacatcacct gtgtctagag aatgcaatag tagtacggat 1260
agctgtgact ccggtccttc taacacacct cctgagatac acccggtggt cccgctgtgc 1320
cccattaaac cagttgccgt gagagtgtgt gggcgtcgcc aggtgtgga atgtatcgag 1380
gacttgctta acgagcctgg gcaacctttg gacttgact gttaaagccc caggccataa 1440
ggtgtaaacc tgtgattgag ttgtgtggtt acgcctttgt ttgctgaatg agttgatgta 1500
agtttaataa aggggtgagat aatgtttaac ttgcatggcg tgttaaatgg ggcggggcct 1560
aaagggtata taatgcgccc tgggctaact ttggttacat ctgacctcat ggaggcttgg 1620
gagtgttttg aagatttttc tgcgtgctgg aacttgctgg aacagagctc taacagtacc 1680
tcttggtttt ggaggtttct gtggggctca tccagggcaa agttagtctg cagaattaag 1740
gaggattaca agtgggaatt tgaagagctt ttgaaacct gtggtgagct gtttgattct 1800
ttgaatctgg gtcaccaggc gcttttccaa gagaaggcca tcaagacttt ggatttttcc 1860
acaccggggc gcgctgcggc tgctgttgc tttttgagtt ttataaagga taaatggagc 1920
gaagaaaccc atctgagcgg ggggtacctg ctggattttc tggccatgca tctgtggaga 1980
gcggttgtga gacacaagaa tcgcctgcta ctgttgtctt ccgtccgccc ggcgataata 2040
ccgacggagg agcagcagca gcagcaggag gaagccaagg gcgagcgcca ggagcagagc 2100
ccatggaacc cgagagccgg cctggacctt cggaatgaa tgtgtacag gtggctgaac 2160
tgtatccaga actgagacgc attttgacaa ttacagagga tgggagggg ctaaggggg 2220
taaagagggg gcggggggct tgtgaggcta cagaggaggc taggaatcta gcttttagct 2280
taatgaccag acaccgtcct gagtgtatta cttttcaaca gatcaaggat aattgcgcta 2340
atgagcttga tctgctggcg cagaagtatt ccatagagca gctgacctat tactggctgc 2400
agccagggga tgattttgag gaggctatta gggatatgca aaagggtgga cttaggccag 2460
attgcaagta caagatcagc aaacttgtaa atatcaggaa ttgttgctac atttctggga 2520
acggggccga ggtggagata gatacggagg atagggtggc ctttagatgt agcatgataa 2580

```

atatgtggcc ggggggtgctt ggcatggacg ggggtggttat tatgaatgta aggtttactg 2640
 gcccccaattt tagcgggtacg gttttccttg ccaataccaa ccttatccta cacgggtgtaa 2700
 gcttctatgg gtttaacaat acctgtgtgg aagcctggac cgatgtaagg gttcggggct 2760
 gtgcctttta ctgctgctgg aaggggggtg tgtgtcgccc caaaagcagg gcttcaatta 2820
 agaaatgcct ctttgaaagg tgtaccttgg gtatcctgtc tgagggtaac tccagggtgc 2880
 gccacaatgt ggctccgac tgtggttgc tcatgctagt gaaaagcgtg gctgtgatta 2940
 agcataacat ggtatgtggc aactgcgagg acagggcctc tcagatgctg acctgctcgg 3000
 acggcaactg tcacctgctg aagaccattc acgtagccag ccactctcgc aaggcctggc 3060
 cagtgtttga gcataacata ctgaccgct gttccttgca tttgggtaac aggagggggg 3120
 tgttcttacc ttaccaatgc aatttgagtc actaagat attgcttgag cccgagagca 3180
 tgtccaaggt gaacctgaac ggggtgtttg acatgaccat gaagatctgg aagggtgctga 3240
 ggtacgatga gacccgcacc aggtgcagac cctgagagtg tggcggtaaa catattagga 3300
 accagcctgt gatgctggat gtgaccgagg agctgaggcc cgatcacttg gtgctggcct 3360
 gcaccgcgc tgagtgtggc tctagcgatg aagatacaga ttgaggtagt gaaatgtgtg 3420
 ggcgtggctt aaggggtggga aagaatata aaggtggggg tcttatgtag tttgtatct 3480
 gttttgcagc agccgcccgc gccatgagca ccaactcgtt tgatggaagc attgtgagct 3540
 catatttgac aacgcgcag ccccatggg ccgggggtgc tcagaatgtg atgggctcca 3600
 gcattgttgg tcgccccgct ctgcccgcac actctactac cttgacctac gagaccgtgt 3660
 ctggaacgcc gtggagact gcagcctccg ccgcccgttc agccgctgca gccaccgccc 3720
 gcgggatgt gactgacttt gctttcctga gcccgcttgc aagcagtga gcttcccgtt 3780
 catccgcccg cgatgacaag ttgacggctc ttttggcaca attggattct ttgaccggg 3840
 aacttaatt cgtttctcag cagctgttgg atctgcgcca gcaggtttct gccctgaagg 3900
 ctctctccc tcccaatcgc gtttaaaaca taaataaaaa accagactct gtttggattt 3960
 ggatcaagca agtgtcttgc tgtctttatt taggggtttt gcgcgcgcgg taggccggg 4020
 accagcggtc tcggctcgtt aggttcctgt gtatttttcc caggacgtgg taaaggtgac 4080
 tctggatgtt cagatacatg ggcataagcc cgtctctggg gtggagtag caccactgca 4140
 gagcttcacg ctgcccgggt gtgtgtaga tgatccagtc gtagcaggag cgctgggctg 4200
 ggtgcctaaa aatgtcttcc agtagcaagc tgattgccag ggcagggccc ttggtgtaag 4260
 tgtttacaaa gcggttaagc tgggatgggt gcatacgtg ggatatgaga tgcatcttgg 4320
 actgtatttt taggttggct atgttcccag ccataccct ccggggattc atgttgtgca 4380
 gaaccaccag cacagtgtat ccggtgcact tgggaaattt gtcatgtagc ttagaaggaa 4440
 atgctgggaa gaacttgag acgcccctgt gacctccaag attttccatg cattcgtcca 4500
 taatgatggc aatgggcccac cgggcgggcg cctggggcga gatatttctg ggatcactaa 4560
 cgtcatagtt gtgttccagg atgagatcgt cataggccat tttacaaaag cgcggggcga 4620
 ggggtgcaga ctgcccgtata atgttccat ccggcccagg ggcgtagtta cctcacaga 4680
 tttgcatttc ccacgcttgg agttcagatg gggggatcat gtctacctgc ggggcgatga 4740
 agaaaacggt ttccggggta ggggagatca gctgggaaga aagcaggttc ctgagcagct 4800
 gcgacttacc gcagccggtg gggccgtaaa tcacacctat taccgggtgc aactggtagt 4860
 taagagagct gcagctgccg tcataccctga gcaggggggc cacttcgtta agcatgtccc 4920
 tgactcgcat gttttccctg accaaatccg ccagaaggcg ctgcgcgccc agcgatagca 4980
 gttcttgcaa ggaagcaaa tttttcaacg gtttgagacc gtccgcccga ggcatgcttt 5040
 tgagcgtttg accaagcagt tccaggcggt cccacagctc ggtcacctgc tctacggcat 5100
 ctcgatccag catatctcct cgtttcgcgg gttggggcgg ctttcgctgt acggcagtag 5160
 tcgggtgctc tccagacggg ccagggtcat gtctttccac gggcgagggt tcctcgtag 5220
 cgtagtctgg gtcacggtga aggggtgcgc tccgggctgc gcgctggcca ggggtgcgtt 5280
 gaggctggtc ctgctggtgc tgaagcgtg ccggtcttcc ccctgcgcgt cggccaggta 5340
 gcatttgacc atggtgtcat agtccagccc ctccgcccgc tggcccttgg cgcgagctt 5400
 gcccttgag gaggcggcg acgaggggca gtgcagactt ttgagggcgt agagcttggg 5460
 cgcgagaaat accgattccg gggagtaggc atccgcgcgc caggccccgc agacggtctc 5520
 gcattccacg agccaggtga gctctggccg ttcgggggtca aaaaccaggt tcccccatg 5580
 ctttttgatg cgtttcttac ctctggtttc catgagccgg tgtccacgct cggtagcga 5640
 aaggctgtcc gtttccccgt atacagactt gagaggcctg tcctcgagcg gtgttccgct 5700
 gtccctcctc tatagaaact cggaccactc tgagacaaag gctcgcgtcc aggccagcac 5760
 gaaggaggct aagtgggagg ggtagcggtc gttgtccact aggggggtcca ctgcgtccag 5820
 ggtgtgaaga cacatgtcgc cctcttcggc atcaaggaaag gtgattgggt ttaggtgta 5880
 gggccacgtga ccgggtgttc ctgaaggggg gctataaaaag ggggtggggg cgcgttcgtc 5940
 ctcaactctc tccgcatcgc tgtctgcgag ggccagctgt tgggggtgagt actccctctg 6000
 aaaaagcggg atgacttctg cgctaagatt gtcagtttcc aaaaacgagg aggatttgat 6060
 attcacctgg ccgcgggtga tgccttttag ggtggccgca tccatctggt cagaaaagac 6120
 aatctttttg ttgtcaagct tgggtggcaa cgaccgtag agggcggttg acagcaactt 6180
 ggcgatggag cgcaggggtt ggtttttgtc gcgctccttg cgctccttgg ccgcatggtt 6240
 tagctgcacg tattcgcgcg caacgcaccg ccattcgga aagacggttg tgcgctcgtc 6300
 gggcaccagg tgcacgcgcc aaccgcggtt gtgcaggggt acaagggtcaa cgctggtggc 6360
 tacctctccg cgtaggcgct cgttgggtcca gcagagggcg ccgcccctgc gcgagcagaa 6420
 tggcggtagg gggcttagct gcgtctcgtc cgggggggtc tgcaagtcta gcgctgctg 6480
 gggcagcagg cgcgcgtcga agtagtctat cttgcatcct

```

ccatgcgcgg gcggcaagcg cgcgctcgta tgggttgagt gggggacccc atggcatggg 6600
gtgggtgagc gcggagggcg acatgccgca aatgtcgtaa acgtagaggg gctctctgag 6660
tattccaaga tatgtagggt agcatcttcc accgcggatg ctggcgcgca cgtaatcgta 6720
tagttcgtgc gagggagcga ggaggtcggg accgaggttg ctacggggcg gctgctctgc 6780
tcggaagact atctgcctga agatggcatg tgagttggat gatattggtt gacgctggaa 6840
gacgttgaag ctggcgtctg tgagacctac cgcgtcacgc acgaaggagg cgtaggagtc 6900
gcgacagctt tgaccagct cggcggtgac ctgcacgtct agggcgagc agtccagggt 6960
ttccttgatg atgtcatact tatctgttcc cttttttttc cacagctcgc ggttgaggac 7020
aaactcttcg cggctcttcc agtactcttg gatcggaac ccgtcggcct ccgaaccgta 7080
agagcctagc atgtagaact ggtagacggc ctggtagggc cagcatccct tttctacggg 7140
tagcgcgtat gcctgcgcgg ccttccggag cgaggtgtgg gtgagcgcaa aggtgtccct 7200
gacctgact ttgaggtact ggtatttgaa gtcagtgtcg tcgcatccgc cctgtcccca 7260
gagcaaaaag tccgtgcgct ttttggaac cggaatttgg agggcgaaag tgacatcggt 7320
gaagagtatc ttcccgcgc gaggcataaa gttgcgtgtg atgcggaagg gtcccggcac 7380
ctcggaacgg ttgttaatta cctgggcggc gaggcacgat tcgtcaaagc cgttgatgtt 7440
gtggccacac atgtaaagtt ccaagaagcg cgggatgccc ttgatggaag gcaatttttt 7500
aagttcctcg taggtgagct cttcagggga gctgagcccc tgctctgaaa gggcccagtc 7560
tgcaagatga gggttggaag cgacgaatga gctccacagg tcacgggcca ttagcatttg 7620
caggtggtcg cgaaagggtc taaactggcg acctatggcc attttttctg gggtagtgca 7680
gtagaaggta agcgggtctt gttcccagcg gtcccaccca aggttcgcgg ctaggtctcg 7740
cgcggcagtc actagaggct catctccgcc gaacttcatg accagcatga agggcacgag 7800
ctgcttccca aagcccccca tccaagtata ggtctctaca tcgtagggtg caaagagacg 7860
ctcggtgcga ggatgcgagc cgatcgggaa gaactggatc tcccggcacc aattggagga 7920
gtggctattg atgtggtgaa agtagaagtc cctgcgacgg gccgaacact cgtgctggct 7980
tttgtaaaaa cgtgcgcagt actggcagcg gtgcacgggc tgtacatcct gcacgaggtt 8040
gacctgacga ccgcgcacaa ggaagcagag tgggaatttg agcccctcgc ctggcgggtt 8100
tggctggttg tcttctactt cggctgcttg tcttgaccg tctggctgct cgaggggagt 8160
tacggtggat cggaccacca cgccgcgcga gccaaaagtc cagatgtccg cgcgcgcgcg 8220
tcggagcttg atgacaacat cgcgcgagat ggagctgtcc atggcttgga gctcccgcgg 8280
cgtcaggtca ggggggagct cctgcaggtt tacctcgcat agacgggtca gggcgcgggc 8340
tagatccagg tgatacctaa tttccagggg ctggttggtg gcggcgctca tggcttgcaa 8400
gagggcgcat ccccgcgggc cgactacggt accgcgcggc gggcggtggg ccgcgggggt 8460
gtccttggat gatgcaccta aaagcgggtg cgcgggcgag ccccgaggag tagggggggc 8520
tccggaccgg ccgggagagg gggcaggggc acgtcggcgc cgcgcgcggg caggagctgg 8580
tgctgcgcgc gtaggttgcg ggcgaacgcg acgacgcggc ggttgatctc ctgaatctgg 8640
cgctctgcg tgaaagacgac gggcccgggt agcttgagcc tgaaagagag ttcgacagaa 8700
tcaatttcgg tgctgttgac ggcggcctgg cgcaaaatct cctgcacgtc tcttgagttg 8760
tcttgatagg cgatctcggc catgaactgc tcgatctctt cctcctggag atctccgcgt 8820
ccggctcgct ccacggtggc ggcgaggtcg ttggaatgc gggccatgag ctgcgagaag 8880
gcgttgaggc ctcccctggt ccagacgcgg ctgtagacca cgcccccttc ggcacgcggc 8940
gcgcgcgatg ccacctgcgc gagattgagc tcacagtgcc gggcgaaagc ggcgtagttt 9000
cgagggcgct gaaagaggta gttgaggtg gtggcggtgt gttctgccac gaagaagtac 9060
ataaccagc gtcgcaacgt ggattcgttg aatcccca aggcctcaag gcgctccatg 9120
gcctcgtaga agtccacggc gaagttgaaa aactgggagt tgcgcgcga cacggttaac 9180
tctctctcca gaagacggat gagctcggcg acagtgtcgc gcacctcgcg ctcaaaggct 9240
acaggggacct cttcttcttc ttcaatctcc tcttccataa gggcctcccc ttcttcttct 9300
tctggcgggc gtgggggagg ggggacacgc cggcgacgac ggcgcaccgg gagggcgctc 9360
acaaagcgct cgatcatctc cccgcgcgca cggcgcatgg tctcggtgac ggcgcggccg 9420
ttctcgcggg ggcgcagttg gaagacgccc cccgtcatgt cccggttatg ggttggcggg 9480
gggctgccat cgggcaggga tacggcgcta acgatgcac tcaacaattg ttgtgtagg 9540
actccgcccg cgagggacct gagcgagtcc gcacgaccg gatcggaata cctctcgaga 9600
aaggcgtcta accagtcaca gtcgcaaggt aggtgagca ccgtggcggg cggcagcggg 9660
cgcggtcgcg ggttgtttct ggcggaggtg ctgctgatga tgtaattaaa gtaggcgggtc 9720
ttgagacggc ggatggtcga cagaagcacc atgtccttgg gtccggcctg ctgaatgcgc 9780
aggcggtcgg ccatgcccga ggccttctgt tgacatcggc gcaggtcttt gtagtagtct 9840
tgcatgagcc tttctaccgg cacttcttct tctccttctt cttgtcctgc atctcttga 9900
tctatcgctg cggcggcggc ggagtttggc cgtagggtgg gccctcttcc tccatgcgt 9960
gtgaccccga agccccctcat cggctgaagc agggctaggt cggcgacaac gcgctcggct 10020
aatatggcct gctgcacctg cgtgaggtga gactggaagt catccatgtc cacaagcgcg 10080
tggtatgcgc ccgtgttgat ggtgtaagtg cagttggcca taacggacca gttaacggtc 10140
tggtgacccg gctgcgagag ctggtgttac ctgagacgcg agtaagccct cgagtcaaat 10200
acgtagtcgt tgcaagtccg caccaggtac tggtatccca ccaaaaagtg cggcgcgggc 10260
tgggcgtaga ggggccagcg tagggtggcc ggggtcccgg gggcgagatc ttccaacata 10320
aggcgatgat atccgtagat gtacctggac atccaggtga tgccggcggc ggtggtggag 10380
gcgcgcggaa agtcgcggac gcggttccag atgttgcgca gcggcaaaaa gtgctccatg 10440
gtcgggacgc tctggccggt caggcgcgcg caatcgttga cgctctagcg tgcaaaagga 10500

```


gagcctgttaa	gcggggcactc	ttccgtgggtc	tgggtggataa	attcgcaagg	gtatcatggc	10560
ggacgaccgg	ggttcagacc	ccgtatccgg	ccgtccggccg	tgatccatgc	ggttaccgcc	10620
cgcggtgtcga	accaggtgtg	gcgacgtcag	acaacggggg	agtgtctcct	ttggcttcct	10680
tccaggcgcg	gcggctgctg	cgctagcttt	tttgggccact	ggcccgcgcg	agcgtaagcg	10740
gttaggcttg	aaagcgaaag	cattaagtgg	ctcgtctcct	gtagccggag	ggttattttc	10800
caagggttga	gtcgcgggac	ccccggttcg	agtctcggac	cggccggact	gcggcgaaacg	10860
gggggtttgcc	tccccgtcat	gcaagacccc	gcttgcaaat	tcctccggaa	acaggggacga	10920
gccccTTTT	tgcttttccc	agatgcattc	ggtgctgcgg	cagatgcgcc	ccccctctca	10980
gcagcgga	gagcaagagc	agcggcagac	atgcagggca	ccctccccct	ctcctaccgc	11040
gtcaggagg	gcgacatccg	cggttgacgc	ggcagcagat	ggtgattacg	aacccccgcg	11100
gcgcccggcc	cggcactacc	tggacttggg	ggaggcgag	ggcctggcgc	ggctaggagc	11160
gccccctcct	gagcggtagc	caagggtgca	gctgaagcgt	gatacgcgtg	aggcgtacgt	11220
gccgcggcag	aacctgtttc	gcgaccgcga	gggagaggag	cccgaaggaga	tgcgggatcg	11280
aaagtctccac	gcagggcgcg	agctgcggca	tggcctgaat	cgcgagcggg	tgctgcgcga	11340
ggaggacttt	gagcccagcg	cgcgaaccgg	gattagtccc	gcgcgcgcac	acgtggcgcg	11400
cgccgacctg	gtaaccgcat	acgagcagac	ggtgaaccag	gagattaaact	ttcaaaaaag	11460
ctttaacaac	cacgtgcgta	cgcttgtggc	gcgcgaggag	gtggctatag	gactgatgca	11520
tctgtgggac	tttgtaaagc	cgctggagca	aaacccaaat	agcaagccgc	tcatggcgca	11580
gctgttcctt	atagtgcagc	acagcaggga	caacgaggca	ttcagggatg	cgctgctaaa	11640
catagtagag	cccgaaggcc	gctggctgct	cgatttgata	aacatcctgc	agagcatagt	11700
ggtgcaggag	gcgagcttga	gcctggctga	caagggtggc	gccatcaact	attccatgct	11760
tagcctgggc	aagttttacg	cccgaagat	ataccatacc	ccttacgttc	ccatagacaa	11820
ggaggtaaa	atcgaggggt	tctacatgcg	catggcgctg	aaggtgctta	ccttgagcga	11880
cgacctgggc	gtttatcgca	acgagcgcat	ccacaaggcc	gtgagcgtga	gccggcgcg	11940
cgagctcagc	gaccgcgagc	tgatgcacag	cctgcaaagg	gccctggctg	gcacgggcag	12000
cgggcataga	gaggccgagt	cctactttga	cgcgggcgct	gacctgcgct	gggccccaa	12060
ccgacgcgcc	ctggaggcag	ctggggccgg	acctgggctg	gcgggtggc	ccgcgcgcgc	12120
tggcaacgtc	ggcggcgctg	aggaatatga	cgaggacgat	gagtagcagc	cagaggacgg	12180
cgagtactaa	gcggtgatgt	ttctgatcag	atgatgcaag	acgcaacgga	cccggcggtg	12240
cgggcgggcg	tgcaagacca	gccgtccggc	cttaactcca	cggacgactg	gcgccaggtc	12300
atggaccgca	tcatgtcgct	gactgcgcgc	aatcctgacg	cgttccggca	gcagcccgag	12360
gccaaccggc	tctccgcaat	tctggaagcg	tggttcccgg	cgcgcgcgaa	ccccacgcac	12420
gagaaggtgc	tggcgatcgt	aaacgcgctg	gccgaaaaca	gggccatccg	gcccagcag	12480
gccggccttg	tctacgacgc	gctgcttcag	cgcgtggctc	gttacaacag	cggcaacgtg	12540
cagaccaacc	tggaccggct	ggtgggggat	gtgcgcgagg	ccgtggcgca	gcgtgagcgc	12600
gcgcagcagc	agggcaacct	gggtcccatg	gttgactacta	acgccttcct	gagtacacag	12660
cccggcaacg	tgccgcgggg	acaggaggac	tacaccaact	ttgtgagcgc	actgcccgtc	12720
atggtgactg	agacaccgca	aagtgaagtg	taccagtctg	ggccagacta	ttttttccag	12780
accagtagac	aaggcctgca	gaccgtaaac	ctgagccagg	ctttcaaaaa	cttgacgggg	12840
ctgtgggggg	tgccgggtcc	cacaggcgac	cgcgcgaccg	tgtctagctt	gctgacgccc	12900
aactcgcgcc	tggtgtgctg	gctaatagcg	cccttcacgg	acagtggcag	cggtgcccgg	12960
gacacatacc	taggtcactt	gctgacactg	taccgcgagg	ccataggtca	ggcgcatgtg	13020
gacgagcata	ctttccagga	gattacaagt	gtcagcccg	cgctggggca	ggaggacacg	13080
ggcagcctgg	aggcaaccct	aaactacctg	ctgaccaacc	ggcggcagaa	gatccccctc	13140
ttgcacagtt	taaacagcga	ggaggagcgc	attttgcgct	acgtgcagca	gagcgtgagc	13200
cttaaacctga	tgccgcgacg	ggtaacggcc	agcgtggcgc	tggacatgac	cgcgcgcaac	13260
atggaaaccg	gcatgtatgc	ctcaaacggg	ccgtttatca	accgccta	ggactacttg	13320
catcgcgcgg	ccgccgtgaa	ccccgagtat	ttcaccaatg	ccatcttgaa	cccgcactgg	13380
ctaccgcccc	ctgggttcta	caccggggga	ttcgaggtgc	ccgagggtaa	cgatggattc	13440
ctctgggagc	acatagacga	cagcgtgttt	tccccgcaac	cgcacaccct	gctagagttg	13500
caacagcgcg	agcaggcaga	ggcggcgctg	cgaaggaaaa	gcttccgcag	gccaagcagc	13560
ttgtccgatc	taggcgctgc	ggcccccgcg	tcagatgcta	gtagcccat	tccaagcttg	13620
atagggtctc	ttaccagcac	tcgcaccacc	cggccgcgcc	tgctggggca	ggaggagtac	13680
ctaaacaact	cgctgtgca	gccgcagcgc	gaaaaaaaacc	tgctccggc	atttcccaac	13740
aacgggatag	agagcctagt	ggacaagatg	agtagatgga	agacgtacgc	gcaggagcac	13800
agggacgtgc	caggccccgcg	cccccccacc	cgtcgtcaaa	ggcacgaccg	tcagcgggg	13860
ctggtgtggg	aggacgatga	ctcggcagac	gacagcagcg	tcctggattt	gggagggagt	13920
ggcaaccctg	ttgcgcacct	tcgccccagg	ctggggagaa	tgttttaaaa	aaaaaaaagc	13980
atgatgcaaa	ataaaaaaact	caccaaggcc	atggcaccga	gcgttggttt	tcttgattc	14040
cccttagtat	gcggcgcgcg	gcgatgtatg	aggaaggtcc	tcctccctcc	tacgagagtg	14100
tggtagcgc	ggcgccagtg	gcggcgcgcg	tgggttctcc	cttcgatgct	ccccctggacc	14160
cgccgtttgt	gcctcccgcg	tacctgcggc	ctaccggggg	gagaaacagc	atccgttact	14220
ctgagttggc	accctatttc	gacaccacc	gtgtgtacct	ggtggacaac	aagtcaacg	14280
atgtggcatc	cctgaactac	cagaacgacc	acagcaactt	tctgaccacg	gtcattcaaa	14340
acaatgacta	cagcccgggg	gaggcaagca	cacagaccat	caatcttgac	gaccggtcgc	14400
actggggcg	gcagctgaaa	accatcctgc	ataccaacat	gccaaatgtg	aacgagttca	14460

tgtttaccaa	taagtttaag	gcgcgggtga	tgggtgcgcg	cttgccctact	aaggacaatc	14520
aggtggagct	gaaatacag	tgggtggagt	tcacgctgcc	cgaggggcaac	tactccgaga	14580
ccatgaccat	agaccttatg	aacaacgcga	tcgtggagca	ctacttgaaa	gtggggcagac	14640
agaacggggt	tctggaaaagc	gacatcgggg	taaagtttga	cacccgcaac	ttcagactgg	14700
ggtttgaccc	cgctcactggt	cttgctatgc	ctgggggtata	tacaaacgaa	gccttccatc	14760
cagacatcat	tttgctgcca	ggatgcgggg	tggacttcac	ccacagccgc	ctgagcaact	14820
tgttgggcat	ccgcaagcgg	caacccttcc	aggagggtct	taggatcacc	tacgatgatc	14880
tggagggtgg	taacattccc	gcactgttgg	atgtggacgc	ctaccaggcg	agcttgaaag	14940
atgacaccga	acaggggcgg	ggtggcgag	gcggcagcaa	cagcagtggc	agcggcgcg	15000
aagagaactc	caacgcggca	gccgcggcaa	tgcagccggt	ggaggacatg	aacgatcatg	15060
ccattcgcg	cgacaccttt	gccacacggg	ctgaggagaa	gcgcgctgag	gccgaagcag	15120
cgcccgaaag	tgccgcccc	gctgcgcaac	ccgaggtcga	gaagcctcag	aagaaaccgg	15180
tgatcaaacc	cctgacagag	gacagcaaga	aacgcagtta	caaccttaata	agcaatgaca	15240
gcaccttcac	ccagtaccgc	agctgggtacc	ttgcatacaa	ctacggcgac	cctcagaccg	15300
gaatccgctc	atggaccctg	ctttgcactc	ctgacgtaac	ctgcgctcg	gagcaggtct	15360
actggtcggt	gccagacatg	atgcaagacc	ccgtgacctt	ccgctccacg	cgccagatca	15420
gcaactttcc	ggtggtgggc	gccgagctgt	tgcccgtgca	ctccaagagc	ttctacaacg	15480
accaggccgt	ctactcccaa	ctcatccgcc	agtttacctc	tctgaccac	gtgttcaatc	15540
gctttcccg	gaaccagatt	ttggcgcgcc	cgccagcccc	caccatcacc	accgtcagtg	15600
aaaacgttcc	tgctctcaca	gatcacggga	cgctaccgct	gcgcaacagc	atcgaggagg	15660
tccagcgagt	gaccattact	gacgccagac	gccgcacctg	cccctacgtt	tacaaggccc	15720
tgggcatagt	ctcgcccgcg	gtcctatcga	gccgcacttt	ttgagcaagc	atgtccatcc	15780
ttatatcgcc	cagcaataac	acagggtggg	gcctgcgctt	cccaagcaag	atgtttggcg	15840
gggccaagaa	gcgctccgac	caacaccag	tgccgctgcg	cgggcactac	cgccgcccct	15900
ggggcgcgca	caaacgcggc	cgcaactggg	gcaccaccgt	cgatgacgcc	atcgacgcgg	15960
tgggtgagga	ggcgcgcaac	tacacgcccc	gcggcgccacc	agtgtccaca	gtggacgcgg	16020
ccattcagac	cggtggtcgc	ggagcccgcc	gctatgctaa	aatgaagaga	cgggcgaggc	16080
gcgtagcacg	tcgccaccgc	cgccgaccgc	gcactgccc	ccaacgcgcg	gcggcgcccc	16140
tgcttaaccg	cgcacgtcgc	accggccgac	ggggcgccat	gcgggcccgt	cgaaggctgg	16200
ccgcggttat	tgctactgtg	ccccccaggt	ccaggcgacg	agcggccgcc	gcagcagccg	16260
cggccattag	tgctatgact	cagggtcgca	ggggcaacgt	gtattgggtg	cgcgactcgg	16320
ttagcggcct	gcgcgtgccc	gtgcgcaccc	gcccccgcg	caactagatt	gcaagaaaaa	16380
actacttaga	ctcgactgtg	tgatgtatc	cagcgcgggc	ggcgcgcaac	gaagctatgt	16440
ccaagcgcaa	aatcaaaaga	gagatgtctc	aggtcatcgc	gccggagatc	tatggcccc	16500
cgaagaagga	agagcaggat	tacaagcccc	gaaagctaaa	gcgggtcaaa	aagaaaaaga	16560
aagatgatga	tgatgaactt	gacgacgagg	tggaaactgt	gcacgctacc	gcgcccaggc	16620
gacgggtaca	gtggaaaagt	cgacgcgtaa	aacgtgtttt	gcgacccggc	accaccgtag	16680
tctttacgcc	cggtgagcgc	tccaccgcga	cctacaagcg	cggtgatgat	gaggtgtacg	16740
gcgacgagga	cctgcttgag	caggccaacg	agcgccctcg	ggagtgttgc	tacggaaaagc	16800
ggcataagga	catgctggcg	ttgccgctgg	acgagggcaa	cccaacacct	agcctaaaagc	16860
ccgtaacact	gcagcaggtg	ctgcccgcg	ttgcaccgtc	cgaagaaaaa	cgcgccctaa	16920
agcgcgagtc	tggtgacttg	gcacccaccg	tgacgctgat	ggtacccaag	cgccagcgac	16980
tggaaagatg	cttggaaaaa	atgaccgtgg	aacctgggct	ggagcccgag	gtccgctgct	17040
ggccaatcaa	gcaggtggcg	ccgggactgg	gcgtgcagac	cgtaggactt	cagataccca	17100
ctaccagtag	caccagtatt	gccaccgcga	cagagggcac	ggagacacaa	acgtccccgg	17160
ttgcctcagc	ggtggcggat	gcgcggtg	agggcgctgc	tgccggccgcg	tccaagacct	17220
ctacggaggt	gcaaaccggc	ccgtggatgt	ttcgcttttc	agccccccgg	cgcccgccgcg	17280
gttcgaggaa	gtacgcgccc	gccagcgccg	tactgcccga	atatgcccta	catccttcca	17340
ttgcgctac	ccccggctat	cgtggctaca	cctaccgccc	cagaagacga	gcaactaccc	17400
gacggcgaa	caccactgga	accggccgccc	gcgctgcgg	tcgccagccc	gtgctggccc	17460
cgatttccgt	gcgcaggggtg	gctcgcgaag	gaggcaggac	cctggtgctg	ccaacagcgc	17520
gctaccaccc	cagcatcggt	taaaagccgg	tctttgtggt	tcttgacgat	atggccctca	17580
cctgccgctt	ccgtttcccg	gtgccgggat	tccgaggaag	aatgcaccgt	aggaggggca	17640
tggccggcca	cggcctgacg	ggcgccatgc	gtcgtgcgca	ccaccggcgg	cgccgcgcgt	17700
cgaccgctcg	catgcgcggc	ggtatcctgc	ccctccttat	tccactgatc	gcccgggcga	17760
ttggcgccgt	gcccgaatt	gcatccgtgg	ccttgacggc	gcagagacac	tgattaaaaa	17820
caagttgcat	gtggaaaaat	caaaataaaa	agtctggact	ctcacgctcg	cttggtctcg	17880
taactatttt	gtagaatgga	agacatcaac	tttgcgtctc	tggcccccg	acacggctcg	17940
cgcccgctca	tgggaaactg	gcaagatata	ggcaccagca	atatgagcgg	tggcgccctc	18000
agctggggct	cgctgtggag	cggcattaaa	aatttcggtt	ccaccgttaa	gaactatggc	18060
agcaaggcct	ggaacagcag	cacaggccag	atgctgaggg	ataagttgaa	agagcaaaa	18120
ttccaacaaa	aggtggtaga	tggcctggcc	tctggcatta	gcgggggtgt	ggacctggcc	18180
aaccaggcag	tgcaaaaata	gattaacagt	aagcttgatc	cccgccttc	cgtagaggag	18240
cctccaccgg	ccgtggagac	agtgtctcca	gagggcgctg	gcgaaaagcg	tccgcgcccc	18300
gacagggaag	aaactctggt	gacgcaata	gacgagcctc	cctcgtacga	ggaggcacta	18360
aagcaaggcc	tgccccaccac	ccgtcccatc	gcgcccattg	ctaccggagt	gctggggcag	18420

```

cacacacccg taacgctgga cctgcctccc cccgccgaca cccagcagaa acctgtgctg 18480
ccaggccccga ccgcgcttgt tgtaacccgt cctagccgcg cgtccctgcg ccgcgccgcc 18540
agcggctccgc gatcgttgcg gcccgtagcc agtggcaact ggcaaaagcac actgaacagc 18600
atcgtgggtc tgggggtgca atccctgaag cgcgcacgat gcttctgaat agctaactgtg 18660
tcgtatgtgt gtcattgatg cgtccatgtc gccgccagag gagctgctga gccgccgcgc 18720
gccgcgtttc caagatggct accccttcga tgatgccgca gtggtcttac atgcacatct 18780
cgggccagga cgctcggag tacctgagcc cgggctgggt gcagtttgcc cgcgccaccg 18840
agcgtactt cagcctgaat aacaagttta gaaacccac ggtggcgctt acgcacgacg 18900
tgaccacaga ccggtccag cgtttgacgc tgcggttcat ccctgtggac cgtgaggata 18960
ctgcgtactc gtacaaggcg cgggtcaccc tagctgtggg tgataaccgt gtgctggaca 19020
tggcttccac gtactttgac atccgcggcg tgctggacag gggccctact ttttagccct 19080
actctggcac tgcctacaac gccctggctc ccaagggtgc ccaaatcct tgccaatggg 19140
atgaagctgc tactgctctt gaaataaacc tagaagaaga ggacgatgac aacgaagacg 19200
aagtagacga gcaagctgag cagcaaaaaa ctcacgtatt tgggcaggcg ccttattctg 19260
gtataaatat tacaaggag ggtattcaaa taggtgtcga aggtcaaaaca cctaaatatg 19320
ccgataaaac atttcaacct gaacctcaaa taggagaatc tcagtggtag gaaactgaaa 19380
ttaatcatgc agctgggaga gtccttaaaa agactacccc aatgaaacca tgttacggtt 19440
catatgcaaa acccacaat gaaaatggag ggcaaggcat tcttgtaaag caacaaaatg 19500
gaaagctaga aagtcaagtg gaaatgcaat ttttctcaac tactgaggcg accgcaggca 19560
atggtgataa ctgactcct aaagtggat tgtacagtga agatgtagat atagaaaccc 19620
cagacactca tatttcttac atgcccacta ttaaggaaag taactcacga gaactaatgg 19680
gccaacaatc tatgccaac aggcctaatt acattgcttt tagggacaat tttattggctc 19740
taatgtatta caacagcacg ggtaatatgg gtgttctggc gggccaagca tcgcagttga 19800
atgctgttgt agatttgcaa gacagaaaca cagagcttcc ataccagctt ttgcttgatt 19860
ccattggtag tagaaccagg tacttttcta tgtggaatca ggctgttgac agctatagg 19920
cagatgttag aattattgaa aatcatggaa ctgaagatga acttccaaat tactgcttcc 19980
cactgggagg tgtgattaat acagagactc ttaccaaggt aaaacctaaa acaggtcagg 20040
aaaatggatg ggaaaaagat gctacagaat tttcagataa aaatgaaata agagttggaa 20100
ataattttgc catggaaatc aatctaaatg ccaacctgtg gagaaatttc ctgtactcca 20160
acatagctgc gtatttgccc gacaagctaa agtacagtcc ttccaacgta aaaatttctg 20220
ataacccaaa cacctacgac tacatgaaca agcagtggtt ggctcccggg ttagtgagct 20280
gtacatttaa ccttgagca cgctggtccc ttgactatat ggacaacgtc aaccatttta 20340
accaccaccg caatgctggc ctgcgtacc gctcaatgtt gctgggcaat ggtcgctatg 20400
tgcccttcca catccagggt cctcagaagt tctttgccat taaaaacctc cttctcctgc 20460
cgggctcata cacctacgag tggaaactca ggaaggatgt taacatggtt ctgcagagct 20520
ccctaggaaa tgacctaaag gttgacggag ccagcattaa gtttgatagc atttgccctt 20580
acgccacctt cttccccatg gcccaacaac ccgcctccac gcttgaggcc atgcttagaa 20640
acgacaccaa cgaccagtcc tttaacgact atctctccgc cgccaacatg cttaccctta 20700
taccgcgcaa cgctaccaac gtgcccatac ccatccccct ccgcaactgg cgggctttcc 20760
gcggtggtgc cttcacgcgc cttaagacta aggaaacccc atcactgggc tcgggctacg 20820
acccttatta cacctactct ggctctatac cctacctaga tggaaacctt tacctcaacc 20880
acacctttta gaaggtggcc attacctttg actcttctgt cagctggcct ggcaatgacc 20940
gcctgcttac cccaacgag tttgaaatta agcgctcagt tgacggggag ggttacaacg 21000
ttgccagtg taacatgacc aaagactggt tcctggtaca aatgctagct aactacaaca 21060
ttggctacca ggtcttctat atcccagaga gctacaagga ccgcatgtac tccttcttta 21120
gaaacttcca gcccatgagc cgtcagggtg tggatgatac taaatacaag gactaccaac 21180
aggtgggcat cctacaccaa cacaacaact ctggatttgt tggctacctt gcccccacca 21240
tgcgcgaaag acaggcctac cctgctaact tcccctatcc gcttatagga aagaccgag 21300
ttgacagcat taccagaaa aagtttcttt gcgacgcac ccttgggcgc atcccattct 21360
ccagtaactt tatgtccatg ggcgactca cagacctggg ccaaaacctt ctctacgcca 21420
actccgcccc cgcgctagac atgacttttg aggtggatcc catggacgag cccaccttcc 21480
tttatgtttt gtttgaagtc tttgacgtgg tccgtgtgca ccggccgcac cgcggcgctc 21540
tcgaaaccgt gtacctgcgc acgcccctct cggccggcaa cgccacaaca taaagaagca 21600
agcaacatca acaacagctg ccgcatggg ctccagtgag caggaaactga aagccattgt 21660
caaagatctt ggttgtgggc catatttttt gggcacctat gacaagcgct ttccaggctt 21720
tgtttctcca cacaagctcg cctgcgcat agtcaatacg gccggtcgcg agactggggg 21780
cgtacactgg atggcctttg cctggaaccc gactcaaaa acatgctacc tctttgagcc 21840
ctttggcttt tctgaccagc gactcaagca ggtttaccag tttgagtacg agtccactct 21900
gcgcgtagc gccattgctt cttccccga ccgctgtata acgctgaaa agtccacca 21960
aagcgtacag gggcccaact cggcgccctg tggactattc tgctgcatgt ttctccacgc 22020
ctttgccaac tggcccaaaa ctcccattga tcacaacccc accatgaacc ttattaccgg 22080
ggtacccaac tccatgctca acagtcccca ggtacagccc accctgcgtc gcaaccagga 22140
acagctctac agcttctctg agcgccactc gccctacttc cgcagccaca gtgcgcagat 22200
taggagcgcc acttcttttt gtcacttgaa aaatatgta ctagagacac 22260
tttcaataaa ggcaaatgct tttatttgta cactctcggt tgattattta ccccaacct 22320
tgccgtctgc gccgtttaaa aatcaaaggg gttctgcgc gcacgctat gcgcactg 22380

```

cagggacacg	ttgcgatact	ggtgtttagt	gctccactta	aactcaggca	caaccatccg	22440
cggcagctcg	gtgaagtgtt	cactccacag	gctgcgcacc	atcaccaacg	cgtttagcag	22500
gtcggggcgc	gatattctga	agtcgcagtt	ggggcctccg	ccctgcgcgc	gcgagtgcg	22560
atacacagg	ttgcagcact	ggaacactat	cagcgcggg	tggtgcacgc	tgccagcac	22620
gctcttgctg	gagatcagat	ccgcgtccag	gtcctccgcg	ttgctcagg	cgaacggagt	22680
caactttggt	agctgccttc	ccaaaaagg	cgcggtccca	ggctttgagt	tgactcgcga	22740
ccgtagtggc	atcaaaagg	gaccgtgccc	ggtctgggcg	ttaggatata	gcgcctgcat	22800
aaaagccttg	atctgcttaa	aagccacctg	agcctttgcg	ccttcagaga	agaacatgcc	22860
gcaagacttg	ccggaaaaact	gattggccgg	acaggccgcg	tcgtgcacgc	agcaccttgc	22920
gtcgggtgtg	gagatctgca	ccacatttcg	gccccaccgg	ttcttcacga	tcttgccctt	22980
gctagactgc	tccttcagcg	cgcgctgccc	gttttcgctc	gtcacatcca	tttcaatcac	23040
gtgctcctta	tttatcataa	tgcttccgtg	tagacactta	agctcgcctt	cgatctcagc	23100
gcagcgggtg	agccacaacg	cgagcccggt	gggctcgtga	tgctttagg	tcacctctgc	23160
aaacgactgc	aggtagcctt	gcaggaatcg	ccccatcatc	gtcacaaagg	tcttggtgct	23220
ggtgaaggct	agctgcaacc	cgcggtgctc	ctcgttcagc	caggtcttgc	atacgcccg	23280
cagagcttcc	acttggtcag	gcagtagttt	gaagttcgcg	tttagatcgt	tatccacgtg	23340
gtacttgctc	tcagtcgcgc	gcgcagcctc	catgcccttc	tcccacgcag	acacgatcgg	23400
cacactcagc	gggttcatac	ccgtaatttc	actttccgct	tcgctgggct	cttctcttcc	23460
ctcttgctgc	cgcataccac	gcgcactcgg	gtcgtcttca	ttcagccgcc	gcactgtgcg	23520
cttacctctt	ttgccatgct	tgattagcac	cggtgggttg	ctgaaaccca	ccatttgtag	23580
cgccacatct	tctctttctt	cctcgctgtc	cacgattacc	tctggtgatg	gcgggcgctc	23640
gggcttggga	gaaggcgct	tctttttctt	cttgggcgca	atggccaaat	ccgcccgcga	23700
ggtcgatggc	cgcggtcgtg	gtgtgcgcgg	caccagcgcg	tcttggtgatg	agtcttctct	23760
gtcctcggac	tcgatacgcc	gcctcatccg	cttttttggg	ggcgcccggg	gaggcgccgg	23820
cgacggggac	ggggacgaca	gctcctccat	ggttggggga	cgctcgcccg	caccgcgtcc	23880
gcgctcgggg	gtgggttcgc	ctgtctcctc	ttcccgaact	gccatttctc	tctctatag	23940
gcagaaaaag	atcatggagt	cagtcgagaa	gaaggacagc	ctaaccgccc	cctctgagtt	24000
cgccaccacc	gcctccaccg	atgccgcaa	cgcgctacc	accttccccc	tcgaggcacc	24060
cccgttgtag	gaggaggaag	tgattatcga	gcaggacca	ggttttgtaa	gcgaagacga	24120
cgaggaccgc	tcagtaccaa	cagaggataa	aaagcaagac	caggacaacg	cagaggcaaa	24180
cgaggaaaca	gtcggggcgg	gggacgaaag	gcatggcgac	tacctagatg	tgggagacga	24240
cgtgctgttg	aagcatctgc	agcgccagtg	cgccattatc	tgcgacgcgt	tgcaagagcg	24300
cagcgatgtg	ccccctcgca	tagcggatgt	cagccttgcc	tacgaacgcc	acctattctc	24360
accgctcgta	cccccaaac	gccaagaaaa	cggcacatgc	gagcccaacc	cgcgctcaa	24420
cttctacccc	gtatttgccg	tgccagaggt	gcttgccacc	tatcacatct	ttttccaaaa	24480
ctgcaagata	cccctatcct	gccgtgccaa	ccgcagccga	gcggacaagc	agctggcctt	24540
gcggcagggc	gctgtcatac	ctgatatcgc	ctcgctcaac	gaagtgccaa	aaatctttga	24600
gggtcttgga	cgcgacgaga	agcgcgcgcc	aaacgctctg	caacaggaaa	acagcgaaaa	24660
tgaaagtccac	tctggagtgt	tggtggaact	cgagggtgac	aacgcgcgcc	tagccgtact	24720
aaaacgcagc	atcgaggtca	cccactttgc	ctaccgcgca	cttaacctac	cccccaagg	24780
catgagcaca	gtcatgagt	agctgatcgt	gcgcctgctg	cagccccctg	agagggatgc	24840
aaatttgcaa	gaacaaacag	aggaggccct	acccgcagtt	ggcgacgagc	agctagcgcg	24900
ctggcttcaa	acgcgcgagc	ctgccgactt	ggaggagcga	cgcaaaacta	tgatggccgc	24960
agtgtcctgt	accgtggagc	ttgagtgcac	gcagcggttc	tttgctgacc	cgagatgca	25020
gcgcaagcta	gaggaaacat	tgcaactcac	ctttcgacag	ggctacgtac	gccaggcctg	25080
caagatctcc	aacgtggagc	tctgcaacct	ggtctcctac	cttgggaatt	tgcaagaaaa	25140
ccgccttggg	caaaacgtgc	ttcattccac	gctcaagggc	gaggcgcgcc	gcgactacgt	25200
ccgcgactgc	gtttacttat	ttctatgcta	cacctggcag	acggccatgg	gcgtttggca	25260
gcagtgtctg	gaggagtgc	acctcaagga	gctgcagaaa	ctgctaaagc	aaaacttgaa	25320
ggacctatgg	acggccttca	acgagcgctc	cgtggccgcg	cacctggcgg	acatcatatt	25380
ccccgaacgc	ctgcttaaaa	ccctgcaaca	gggtctgcca	gacttcacca	gtcaaagcat	25440
gttgacagaac	tttaggaact	ttatcctaga	gcgctcagga	atcttgcccg	ccacctgctg	25500
tgcaattcct	agcgactttg	tgccatttaa	gtaccgcgaa	tgccctccgc	cgctttgggg	25560
ccactgctac	cttctgcagc	tagccaacta	ccttgccctac	cactctgaca	taatggaaga	25620
cgtgagcggt	gacggctctc	tgagagtgtc	ctgtcgctgc	aacctatgca	ccccgcaccg	25680
ctccctgggt	tgcaattcgc	agctgcttaa	cgaaagtcaa	attatcggtg	cctttgagct	25740
gcagggtccc	tcgcctgacg	aaaagtccgc	ggctccgggg	ttgaaactca	ctccggggct	25800
gtggacgtcg	gcttaccttc	gcaaatttgt	acctgaggac	taccacgccc	acgagattag	25860
gttctacgaa	gaccaatccc	gcccgcacaa	tgccgagctt	accgcctgcg	tcattacca	25920
ggggcacatt	cttgcccaat	tgcaagccat	caacaaagcc	cgccaagagt	ttctgtacg	25980
aaaggacgag	gggggtttact	tggaacccca	gtccggcgag	gagctcaacc	caatcccccc	26040
gccgcccgcg	ccctatcagc	agcagccgcg	ggccttgctc	tcccaggatg	gcacccaaaa	26100
agaagctgca	gctgcccgcc	ccacccacgg	acgaggagga	atactgggac	agtcaggcag	26160
aggaggtttt	ggacgaggag	gaggaggaca	tgatggaaga	ctgggagagc	ctagacgagg	26220
aagcttccga	ggtcgaagag	gtgtcagacg	aaacaccgtc	accctcggtc	gcattccctt	26280
cgccggcgcc	ccagaaatcg	gcaaccggtt	ccagcatggc	tacaacctcc	gctcctcagg	26340

cgccgcccgc	actgcccgtt	cgccgaccca	accgtagatg	ggacaccact	ggaaccaggg	26400
ccggtaagtc	caagcagccg	ccgcccgttag	cccaagagca	acaacagcgc	caaggctacc	26460
gctcatggcg	cgggcacaag	aacgccatag	ttgcttgctt	gcaagactgt	gggggcaaca	26520
tctccttcgc	ccgcccgttt	cttctctacc	atcacggcgt	ggccttcccc	cgtaacatcc	26580
tgcattacta	ccgtcatctc	tacagcccat	actgcaccgg	cggcagcggc	agcggcagca	26640
acagcagcgg	ccacacagaa	gcaaaaggcg	ccgatagca	agactctgac	aaagcccaag	26700
aaatccacag	cggcggcagc	agcaggagga	ggagcgtgc	gtctggcgcc	caacgaacct	26760
gtatcgaccc	gcgagcttag	aaacaggatt	tttccactc	tgtatgctat	atttcaacag	26820
agcagggggc	aagaacaaga	gctgaaaata	aaaaacaggt	ctctgcgac	cctcaccgcg	26880
agctgcctgt	atcacaaaag	cgaagatcag	cttcggcgca	cgctggaaga	cgcggaggct	26940
ctcttcagta	aatactgctc	gctgactctt	aaggactagt	ttcggccctt	ttctcaaatt	27000
taagcgcgaa	aactacgtca	tctccagcgg	ccacaccccg	cgcagcacc	tgtcgtcagc	27060
gccattatga	gcaaggaaat	tcccacgccc	tacatgtgga	gttaccagcc	acaaatggga	27120
cttgccgctg	gagctgccc	agactactca	acccgaataa	actacatgag	cgcgggaccc	27180
cacatgatat	ccccgggtcaa	cggaatccgc	gcccaccgaa	accgaattct	cttggaaacag	27240
gcggctatta	ccaccacacc	tcgtaataac	cttaatcccc	gtagttggcc	cgtcgccctg	27300
gtgtaccagg	aaagtcccgc	tcccaccact	gtggtacttc	ccagagacgc	ccaggccgaa	27360
gttcagatga	ctaactcagg	ggcgagcgtt	gcggggcggt	ttcgtcacag	ggtgcggctg	27420
cccgggacag	gtataactca	cctgacaatc	agagggcgag	gtattcagct	caacgacgag	27480
tccggtgagct	cctcgcttgg	tctccgtccg	gacgggacat	ttcagatcgg	cggcgccggc	27540
cgtccttcat	tcacgcctcg	tcaggcaatc	ctaactctgc	agacctcgtc	ctctgagccg	27600
cgtcttgag	gcattggaac	tctgcaattt	attgaggagt	ttgtgccatc	ggtctacttt	27660
aaaccccttct	cgggacctcc	cggccactat	ccggatcaat	ttattcctaa	ctttgacgcg	27720
gtaaaggact	cggcggacgg	ctacgactga	taattaagtg	gagaggcaga	gcaactgcgc	27780
ctgaaacacc	tggtccactg	tcgcgcgcc	aaagtgtttg	cccgcgactc	cgttgagtgt	27840
tgctactttg	aattgcccga	ggatcatatc	gaggatcttt	gttgccatct	ctgtgctgag	27900
tataataaat	acagaaatta	aaatatactg	gggtccctat	cgccatcctg	taaacgccac	27960
cgtcttcacc	cgcccaagca	aaccaaggcg	aaccttacct	ggtactttta	acatctctcc	28020
ctctgtgatt	tacaacagtt	tcaaccacga	cggagtga	ctacgagaga	acctctccga	28080
gctcagctac	tccatcagaa	aaaacaccac	cctccttacc	tgccgggaac	gtacccttaa	28140
ttaaaagtca	ggcttcctgg	atgtcagcat	ctgactttgg	ccagcacctg	tcccgcggat	28200
ttgttccagt	ccaactacag	cgacccaccc	taacagagat	gaccaacaca	accaacgcgg	28260
ccgcccgtac	cggacttaca	tctaccacaa	atacacccca	agtttctgcc	tttgtcaata	28320
actgggataa	cttgggcatg	tggtggttct	ccatagcgct	tatgtttgta	tgctttatta	28380
ttatgtggct	catctgctgc	ctaaagcgca	aacgcgccc	accacccatc	tatagtccca	28440
tcattgtgct	acacccaaac	aatgatggaa	tccatagatt	ggacggactg	aaacacatgt	28500
tcttttctct	tacagtatga	ttaaatgaga	ttaatgaagg	aatttctgtc	cagtttattc	28560
agcagcacct	ccttgccctc	ctcccagctc	tggtattgca	gcttccctct	ggctgcaaac	28620
tttctccaca	atctaaatgg	aatgtcagtt	tctcctgtt	cctgtccatc	cgcacccact	28680
atcttcatgt	tggtgcagat	gaagcgcgca	agaccgtctg	aagatacctt	caaccccggt	28740
tatccatatg	acacggaaac	cgttcctcca	actgtgctt	ttcttactcc	tccctttgta	28800
tcccccaatg	ggtttcaaga	gagtcctcct	gggttactct	ctttgcgcct	atccgaacct	28860
ctagttacct	ccaatggcat	gcttgcgctc	aaaaatgggca	acggcctctc	tctggacgag	28920
gccggcaacc	ttacctcca	aaatgtaacc	actgtgagcc	cacctctcaa	aaaaaccaag	28980
tcaaacataa	acctggaaat	atctgcaccc	ctcacagtta	cctcagaagc	cctaactgtg	29040
gctgcgcggc	cacctcta	ggtcgcgggc	aacacactca	ccatgcaatc	acaggccccc	29100
ctaaccgtgc	acgactccaa	acttagcatt	gccacccaag	gacccctcac	agtgtcagaa	29160
ggaaagctag	ccctgcaaac	atcaggcccc	ctcaccacca	ccgatagcag	tacccttact	29220
atcactgcct	cacccctct	aactactgcc	actggtagct	tgggcattga	cttgaagag	29280
cccatttata	cacaaaatgg	aaaactagga	ctaaagtacg	gggtcctttt	gcatgtaaca	29340
gacgacctaa	acactttgac	cgtagcaact	gggtccaggtg	tgactattaa	taatacttcc	29400
ttgcaaaacta	aagtactgg	agccttgggt	tttgattcac	aaggcaatat	gcaacttaat	29460
gtagcaggag	gactaaggat	tgattctcaa	aacagacgcc	ttatacttga	tgttagttat	29520
ccgtttgatg	ctcaaaacca	actaaatcta	agactaggac	agggccctct	ttttataaac	29580
tcagcccaca	acttgatat	taactacaac	aaaggccttt	acttgtttac	agcttcaaac	29640
aattccaaaa	agcttgaggt	taacctaaagc	actgccaagg	gggtgatgtt	tgacgtaca	29700
gccatagcca	ttaatgcagg	agatgggctt	gaatttggtt	cacctaatgc	accaaacaca	29760
aatcccctca	aaacaaaaat	tggccatggc	ctagaatttg	attcaaacaa	ggctatggtt	29820
cctaaactag	gaactggcct	tagttttgac	agcacaggtg	ccattacagt	aggaacaaa	29880
aataatgata	agctaacttt	gtggaccaca	ccagctccat	ctcctaactg	tagactaaat	29940
gcagagaaa	atgctaaact	cactttggtc	ttacaaaaat	gtggcagtc	aatacttgct	30000
acagtttcag	ttttggctgt	taaaggcagt	ttggctccaa	tatctggaac	agttcaaa	30060
gctcatctta	ttataagatt	tgacgaaaat	ggagtgtctac	taaacaattc	cttcttgag	30120
ccagaatatt	ggaactttag	aaatggagat	cttactgaag	gcacagccta	tacaaacgct	30180
gttggattta	tgctaact	atcagcttat	ccaaaaatctc	acggtaaaac	tgccaaaagt	30240
aacattgtca	gtcaagttta	cttaaacgga	gacaaaacta	aacctgtaac	actaacctt	30300

```

acactaaacg gtacacagga aacaggagac acaactccaa gtgcatactc tatgtcattt 30360
tcatgggact ggtctggcca caactacatt aatgaaatat ttgccacatc ctcttacact 30420
ttttcatata ttgcccaga ataaagaatc gtttgtgtta tgtttcaacg tgttttattt 30480
tcaattgcag aaaatttcaa gtcatttttc attcagtagt atagccccac caccacatag 30540
cttatacaga tcaccgtacc ttaatcaaac tcacagaacc ctagtattca acctgccacc 30600
tccctcccaa cacacagagt acacagtcct ttctccccgg ctggccttaa aaagcatcat 30660
atcatgggta acagacatat tcttagtgtt tatattccac acggtttcct gtcgagccaa 30720
acgctcatca gtgatattaa taaactcccc gggcagctca cttaagttca tgtcgtgtgc 30780
cagctgtcga gccacaggct gctgtccaac ttgcggttgc ttaacgggag cgaaggaga 30840
agtccacgcc tacatggggg tagagtcata atcgtgcatac aggatagggc ggtggtgtgc 30900
cagcagcgcg cgaataaact gctgccgccc ccgctccgct ctgcaggaat acaacatggc 30960
agtggctctc tcagcgatga ttgcacccgc ccgcagcata aggcgccttg tctccgggc 31020
acagcagcgc acctgatct cacttaaatc agcacagtaa ctgcagcaca gcaccacaat 31080
attgttcaaa atccccacagt gcaaggcgct gtatccaaag ctcatggcgg ggaccacaga 31140
acccacgtgg ccatcatacc acaagcgag gttagattaag tggcgacccc tcataaacac 31200
gctggacata aacattacct tttttggcat gttgtaattc accacctccc ggtaccatat 31260
aaacctctga ttaaacatgg cgccatccac caccatccta aaccagctgg ccaaaacctg 31320
cccgcgggct atacactgca gggaaccggg actggaacaa tgacagtggg gagcccagga 31380
ctcgtaacca tggatcatca tgctcgtcat gatataatg ttggcacaac acaggcacac 31440
gtgcatacac ttctcagga ttacaagctc ctcccgcgtt agaaccatat ccaggggaac 31500
aaccatttcc tgaatcagcg taaatcccac actgcaggga agacctcgca cgtaactcac 31560
gttgtgcatt gtcaaaagtgt tacattcggg cagcagcgga tgatcctcca gtatggtagc 31620
gcggttttct gtctcaaaag gaggtagacg atccctactg tacggagtgc gccgagaca 31680
ccgagatcgt gttggtcgtg gtgtcatgcc aaatggaacg ccggacgtag tcatatttcc 31740
tgaagcaaaa ccagggtcgg gcgtgacaaa cagatctcgg tctccggtct cgccgcttag 31800
atcgctctgt gtagtagttg tagtatatcc actctctcaa agcatccagg cgccccctgg 31860
cttcgggttc tatgtaaaact cttcatgctg ccgctgcctt gataacatcc accaccgag 31920
aataagccac acccagccaa cctacacatt cgttctgcga gtcacacacg ggaggagcgg 31980
gaagagctgg aagaacctag tttttttttt tattccaaaa gattatccaa aacctcaaaa 32040
tgaagatcta ttaagtgaac gcgctccctt ccggtggcgt ggtcaaaactc tacagccaaa 32100
gaacagataa tggcatttgt aagatgttgc acaatggcct ccaaaaggca aacggccctc 32160
acgtccaagt ggacgtaaag gctaaacctt tcaggtgtaa tctcctctat aaacattcca 32220
gcaccttcaa ccattgccaa ataatttcta tctcgccacc ttctcaatat atctctaagc 32280
aaatcccgaa tattaagtcc ggccattgta aaaatctgct ccagagcgcc ctccaccttc 32340
agcctcaagc agcgaatcat gattgcaaaa attcagggtt ctacagacc tgtataagat 32400
tcaaaagcgg aacattaaca aaaataccgc gatcccgtag gtcccttcgc agggccagct 32460
gaacataact gtgcaggtct gcacggacca gcgcggccac tccccgccca ggaaccttga 32520
caaaagaacc cacactgatt atgacacgca tactcggagc tatgctaacc agcgtagccc 32580
cgatgtaagc ttgtgtgcat gggcggcgat ataaaatgca aggtgctgct caaaaaatca 32640
ggcaaaagcct cgcgcaaaaa agaaagcaca tcgtagtcat gctcatgagc ataaaggcag 32700
gtaagctcgg gaaccaccac agaaaaagac accatttttc tctcaaacat gtctgcgggt 32760
ttctgcataa acacaaaata aaataaaca aaaacattta aacattagaa gctgtcttta 32820
caacaggaaa aacaaccctt ataagcataa gacggactac ggccatgccg gcgtgaccgt 32880
aaaaaaactg gtcaccgtga ttaaaaagca ccaccgacag ctccctcggtc atgtccggag 32940
tcataatgta agactcggtg aacacatcag gttgattcat cggtcagtgc taaaaagcga 33000
ccgaaatagc ccgggggaat acataaccgc aggcgtagag acaacattac agccccata 33060
ggaggtataa caaaattaat aggagagaaa aacacataaa cacctgaaaa accctcctgc 33120
ctaggcaaaa tagcaccctc ccgctccaga acaacataca gcgcttcaca gcggcagcct 33180
aacagtcagc cttaccagta aaaaagaaaa cctattaaaa aaacaccact cgacacggca 33240
ccagctcaat cagtcacagt gtaaaaaagg gccaaagtgc ttacactgca gcaggtgtga 33300
ctcagccatg gcacctctgc agcctgggta ccctgcttgg ggcatggccc cttatagctg 33360
ggcggggcgt gggggctctg taggagtggc agcgacctca gtgtttgtct ttgctctgaa 33420
gagccctcca ggtgcttgat cccacctttt cccagcagga acaactcctgc ctgccttacc 33480
acctgtcctg gctgatggcc tgttctctgc tcttttggcc cctgcccaga ctccatgtt 33540
cctggacttg tggcttcctc caaccagggg ctctcaagcc tccatacctg gtcccacctc 33600
tccaggccgt gggaggaggg ttgaggaggg tggagggcac ctggttgggg gcagcctggg 33660
tgttccctc ccatccctc cctgggcctc ccaggccccc tctactcttg agcaatgctc 33720
ttgagagctt cctgctggc tcttaaccca gggcaagccc tggaaaggga gaccaggagc 33780
actctcacca cctccttacc ttttccctg gaaaaatctt ctgtatactt cccattttaa 33840
gaaaaactaca attcccaaca catacaagtt actccgcctt aaaacctacg tcaccgccc 33900
cgttcccacg ccccgccca cgtcacaaac tccacctcct cattatcata ttggcttcaa 33960
tccaaaaataa ggtatattat tgatgatg 33988

```

<210> 15

<211> 34737

<212> DNA

<213> Adenovirus subgroup C

<400> 15

```

catcatcaat aatatacctt attttggatt gaagccaata tgataatgag ggggtggagt 60
ttgtgacgtg gcgcggggcg tgggaacggg gcgggtgacg tagtagtggt gcggaagtgt 120
gatgttgcaa gtgtggcgga acacatgtaa gcgacggatg tggcaaaagt gacgtttttg 180
gtgtgcgcgc gtgtacacag gaagtgacaa ttttcgcgcg gttttaggcg gatgttgtag 240
taaatttggg cgtaaccgag taagatttgg ccattttcgc gggaaaactg aataagagga 300
agtgaatctt gaataatttt gtgttactca tagcgcgtaa tattttgtcta gggccgcggg 360
gactttgacc gtttacgtgg agactcgccc aggtgttttt ctcaggtgtt ttccgcgttc 420
cgggtcaaac ttggcgtttt attattatag tcagctgacg tgtagtgtat ttatacccg 480
tgagttcttc aagaggccac tcttgagtgc cagcgagtag agttttcttc tccgagccgc 540
tccgacaccg ggactgaaaa tgagacatga ggtactggct gataatcttc cacctcctag 600
ccattttgaa ccacctaccc ttcacgaact gtatgattta gacgtgacgg cccccgaaga 660
tcccaacgag gaggcggttt cgcagatttt tcccgactct gtaatgttgg cgggtgcagga 720
aggatttgac ttactcactt ttccgcgggc gcccggttct ccggaagccgc ctcacctttc 780
ccggcagccc gagcagccgg agcagagagc cttgggtccg gtttgccacg aggctggctt 840
tccaccaggt gacgacgagg atgaagaggg tgaggagttt gtgttagatt atgtggagca 900
ccccgggacg ggttgacagt cttgtcatta tcaccggagg aatacggggg acccagatat 960
tatgtgttcg ctttgctata tgaggacctg tggcatgttt gtctacagta agtgaaaatt 1020
atgggcagtg ggtgatagag tgggtgggtt ggtgtggtta tttttttttt aatttttaca 1080
gttttgtggt ttaaagaatt ttgtattgtg atttttttaa aaggctcctgt gtcctgaacct 1140
gagcctgagc ccgagccaga accggagcct gcaagacctt cccgcgctcc taaaatggcg 1200
cctgtctatc tgagacgccc gacatcacct gtgtctagag aatgcaatag tagtacggat 1260
agctgtgact ccggtccttc taacacacct cctgagatac acccggtggt cccgctgtgc 1320
cccattaaac cagttgccgt gagagtgtgt gggcgtcgcc aggtgtgtga atgtatcgag 1380
gacttgctta acgagcctgg gcaacctttg gacttgagct gtaaacgccc caggccataa 1440
ggtgtaaacc tgtgattgag tgtgtggtta acgcctttgt ttgctgaatg agttgatgta 1500
agtttaataa agggtagat aatgtttaac ttgcatggcg tgttaaatgg ggcggggcct 1560
aaaggggata taatgcgcgc tgggctaata ttggttacct ctgacctcat ggaggcttgg 1620
gagtgttttg aagatttttc tgcgtgtcgt aacttgctgg aacagagctc taacagtacc 1680
tcttggtttt ggaggtttct gtggggctca tcccaggcaa agttagtctg cagaattaa 1740
gaggattaca agtgggaatt tgaagacctt ttgaaatcct gtggtgagct gtttgattct 1800
ttgaatctgg gtcaccaggc gcttttccaa gagaaggtca tcaagacttt ggatttttcc 1860
acaccggggc gcgctgcggc tgctgttgct tttttgagtt ttataaagga taaatggagc 1920
gaagaaaccc atctgagcgg ggggtacctg ctggattttc tggccatgca tctgtggaga 1980
gcgggtgtga gacacaagaa tcgctgtcta ctgttgcctt ccgtccgccc ggcgataata 2040
ccgacggagg agcagcagca gcagcaggag gaagccaggc ggcggcgcca ggagcagagc 2100
ccatggaacc cgagagccgg cctggaccct cgggaatgaa tgtgtacag gtggctgac 2160
tgtatccaga actgagacgc attttgacaa ttacagagga tgggcagggg ctaaaagggg 2220
taaagaggga gcggggggct tgtgaggcta cagaggaggc taggaatcta gcttttagct 2280
taatgaccag acaccgtcct gagtgtatta cttttcaaca gatcaaggat aattgcgcta 2340
atgagcttga tctgctggcg cagaagtatt ccatagagca gctgaccact tactggctgc 2400
agccagggga tgattttgag gaggctatta ggttatatgc aaaggtggca cttaggccag 2460
attgcaagta caagatcagc aaacttgtaa atatcaggaa ttgttgctac atttctggga 2520
acggggccga ggtggagata gatacggagg atagggtggc ctttagatgt agcatgataa 2580
atatgtggcc ggggtgctt ggcatggacg ggggtggtat tatgaatgta aggtttactg 2640
gccccaatth tagcgtacg gttttcctgg ccaataccaa ccttatccta caccgtgtaa 2700
gcttctatgg gtttaacaat acctgtgtgg aagcctggac cgatgtaagg gttcggggct 2760
gtgcctttta ctgctgctgg aaggggggtg tgtgtcgccc caaaagcagg gcttcaatta 2820
agaaatgcct ctttgaaagg tgtacctgg gtatcctgtc tgagggtaac tccagggtgc 2880
gccacaatgt ggcctccgac tgtggtgtct tcatgctagt gaaaagcgtg gctgtgatta 2940
agcataacat ggtatgtggc aactgcgagg acagggcctc tcagatgtgt acctgctcgg 3000
acggcaactg tcacctgctg aagaccattc acgtagccag ccactctcgc aaggcctggc 3060
cagtgtttga gcataacata ctgacccgct gttccttgca ttggggtaac agggggggg 3120
tgttcttacc ttaccaatgc aatttgagtc acactaagat attgcttgag cccgagagca 3180
tgtccaaggt gaacctgaac ggggtgtttg acatgaccat gaagatctgg aaggtgctga 3240
ggtacgatga gacccgcacc aggtgcagac cctgcgagtg tggcggtaaa catattagga 3300
accagctgtg gatgctggat gtgaccgagg agctgaggcc cgatcacttg gtgctggcct 3360
gcacccgcgc tgagtttggc tctagcgatg aagatacaga ttgaggtact gaaatgtgtg 3420
ggcgtggctt aagggtggga aagaatataa aaggtggggg tcttatgtag tttgttatct 3480
gttttgacg agccgcggcc gccatgagca ccaactcgtt tgatggaagc attgtgagct 3540
catatttgac aacgcgcatg cccccatggg ccgggggtgc tcagaatgtg atgggtcca 3600
gcattgatgg tcgccccgtc ctgccccgaa actctactac cttgacctac gagaccgtgt 3660
ctggaacgcc gttggagact gcagcctccg ccgcccgttc agccgctgca gccaccgccc 3720
gcgggattgt gactgacttt gctttcctga gcccgcttgc aagcagtgca gcttcccgtt 3780

```

catccgcccc cgatgacaag ttgacggctc ttttggcaca attggattct ttgacccggg 3840
aacttaatgt cgtttctcag cagctgttgg atctgcccga gcaggtttct gccctgaagg 3900
cttctctccc tcccaatgcg gtttaaaaca taaataaaaa accagactct gtttggattt 3960
ggatcaagca agtgtcttgc tgtctttatt taggggtttt gcgcgcgcgg taggcccggg 4020
accagcggtc tcggctcgtt agggctctgt gtattttttc caggacgtgg taaagggtgac 4080
tctggatgtt cagatacatg gccataagcc cgtctctggg gtggaggtag caccactgca 4140
gagcttcatg ctgcgggggtg gtgtttaga tgatccagtc gtagcaggag cgctgggctg 4200
gggtgcctaaa aatgtctttc agtagcaagc tgattgccag gggcaggccc ttggtgtaag 4260
tgtttacaaa gcggttaagc tgggatgggt gcatacgtgg ggatatgaga tgcattcttg 4320
actgtatttt taggttggct atgttcccag ccataccct ccggggattc atgttgtgca 4380
gaaccaccag cacagtgtat ccggtgcact tgggaaattt gtcattgtag ttagaaggaa 4440
atgctgtgaa gaacttgag acgcccctgt gacctcaag attttccat cattcgtcca 4500
taatgatggc aatgggccc cgggcggcgg cctgggcgaa gatatttctg ggatcactaa 4560
cgtcatagtt gtgttccagg atgagatcgt cataggccat ttttacaag gcggggcgga 4620
gggtgcccaga ctgcgggtata atggttccat ccggcccagg ggcgtagtta ccctcacaga 4680
tttgcatttc ccacgctttg agttcagatg gggggatcat gtctacctgc ggggcgatga 4740
agaaacagg ttccggggta ggggagatca gctgggaaga aagcaggttc ctgagcagct 4800
gcgacttacc gcagccgggtg gggccgtaaa tcacacctat taccgggtgc aactggtagt 4860
taagagagct gcagctgccc tcatccctga gcaggggggc cacttctgta agcatgtccc 4920
tgactcgcat gttttccctg accaaatccg ccagaaggcg ctgcgcgccc agcgatagca 4980
gttcttgcaa ggaagcaaa ttttcaacg gtttgagacc gtccgcccga ggcatgctt 5040
tgagcgtttg accaagcagt tccaggcggg cccacagctc ggtcacctgc tctacggcat 5100
ctcgatccag catatctcct cgtttcgcgg gttggggcgg ctttcgctgt acggcagtag 5160
tcggtgctcg tccagacggg ccagggtcat gtctttccac gggcgacagg tctctgctag 5220
cgtagtctgg gtcacgggtg aggggtgcgc tccgggctgc gcgctggcca ggggtgcctt 5280
gaggtctggc ctgctgtgtg tgaagcgtg ccggtcttcg cctgcgcgtg cggccaggtg 5340
gcatttgacc atggtgtcat agtccagccc ctccgcggcg tggcccttgg cgcgcagctt 5400
gcccttgagg gaggcgcgc acgaggggca gtgcagactt ttgagggcgt agagcttggg 5460
gcgcgaaaa accgattccg gggagtaggc atccgcgcgg caggccccgc agacgggtctc 5520
gcattccacg agccaggtga gctctggccg ttccgggtca aaaaccagg ttccccatg 5580
ctttttgatg cgtttcttac ctctggttcc catgagccgg tgtccacgct cggtagcaga 5640
aaggctgtcc gtgtccctgt atacagactt gagaggccctg tctcagagcg gtgttcccg 5700
gtcctcctcg tatagaaact cggaccactc tgagacaaag gctcgcgtcc aggccagcac 5760
gaaggaggct aagtgggagg ggtagccctg gttgtccact aggggggtcca ctgcctcag 5820
gggtgaaga cacatgtcgc cctcttcggc atcaagggaag gtgattggtt tgtaggtgta 5880
ggccacgtga ccgggtgttc ctgaagggg gctataaaag ggggtggggg cgcgttctgc 5940
ctcactctct tccgcctcgc tgtctgcgag gggcagctgt tgggggtgagt actccctctg 6000
aaaagcgggg atgacttctg cgctaagatt gtcagtttcc aaaaacgagg aggtattgat 6060
attcacctgg ccgcggtga tgcctttgag ggtggccgca tccatctggt cagaaaaagc 6120
aatctttttg ttgtcaagct tgggtggcaa cgacccgtag agggcgttgg acagcaactt 6180
ggcgtatggg cgcagggttt ggtttttgtc gcgatccggc cgtcccttgg ccgcgatgtt 6240
tagctgcacg tattcgcgcg caacgcaccg ccattcggga aagacgggtg tgcgctcgtc 6300
gggaccacgg tgcacgcgcc aaccgcggtt gtgcagggtg acaaggtcaa cgtggtggc 6360
tacctctccg cgtaggcgct cgttgggtcca gcagagggcg ccgcccttgc gcgagcaga 6420
tggcgttagg gggcttagct gcgtctcgtc cgggggtctt gcgtccacgg taaagacccc 6480
gggcagcagg cgcgcgtcga agtagtctat cttgcatect tgcaagtcta gcgcctgctg 6540
ccatgcgcgg cgggcaagcg cgcgctcgtg tgggttgaat gggggacccc atggcaggg 6600
gtgggtgagc gcggaggcgt acatgccga aatgtcgtaa acgtagaggg gctctctgag 6660
tattccaaga tatgtagggt agcatcttcc accgcgagtg ctggcgcgca cgtaatcgta 6720
tagttcgtgc gagggagcga ggaggtcggg accgaggttg ctacggggcg gctgctctgc 6780
tcggaagact atctgcctga agatggcatg tgagttggat gatattggtg gacgtggaa 6840
gacgttgag ctggcgtctg tgagacctac cgcgtcacgc acgaaggagg cgtaggagtc 6900
gcgcagcttg ttgaccagct cggcgggtgac ctgcacgtct agggcgagtg agtccagggt 6960
ttccttgatg atgtcatact tatcctgtcc cttttttttc cacagctcgc ggttagggac 7020
aaactcttcg cggtctttcc agtactcttg gatcgaaac ccgtcggcct ccgaacggta 7080
agagcctagc atgtagaact ggttgacggc ctggtagggc cagcatccct tttctacggg 7140
tagcgcgtat gcctgcgcgg ccttccggag cgaggtgttg gtgagcgcaa aggtgtccct 7200
gacctgact ttgaggtact ggtatttgaa gtcagtgctg tcgcatccgc cctgctccca 7260
gagcaaaaag tccgtgcgct ttttggaaag cggatttggc agggcgaaag tgacatcgtt 7320
gaagagtatc tttcccgcgc gaggcataaa gttgcgtgtg atgcggaagg gtcccggac 7380
ctcggaacgg ttgttaatta cctgggcggc gagcacgac tcgtcaaaag cgttgatgtt 7440
gtggcccaca atgtaaagt ccaagaagcg cgggatgccc ttgatggaag gcaatttttt 7500
aagttcctcg taggtgagct ctacagggga gctgagccc tgctctgaaa gggcccagtc 7560
tgcaagatga ggggttgaag cgacgaatga gctccacagg tcacgggcca ttagcatttg 7620
caggtggtcg cgaaaggctc taaactggcg acctatggcc attttttctg gggtagtga 7680
gtagaaggta agcgggtctt gttcccagcg gtcccatcca aggttcgcgg ctaggctctg 7740

cgcggcagtc actagaggct catctccgcc gaacttcatt accagcatga agggcacgag 7800
 ctgcttccca aaggccccc tccaagtata ggtctctaca tcgtaggatga caaagagacg 7860
 ctcggtgcga ggatgcgagc cgatcgggaa gaactggatc tcccgccacc aattggagga 7920
 gtggctattg atgtggtgaa agtagaagtc cctgcgacgg gccgaacact cgtgctggct 7980
 tttgtaaaaa cgtgcgcagt actggcagcg gtgcacggcg tttacatcct gcacgaggtt 8040
 gacctgacga ccgcgcacaa ggaagcagag tgggaatttg agccctcgc ctggcgggtt 8100
 tgctgggtgg tcttctactt cggctgcttg tccttgaccg tctggctgct cgaggggagt 8160
 tacgggtgat cggaccacca cgccgcgcga gcccacagtc cagatgtccg cgcgcggcgg 8220
 tcggagcttg atgacaacat cgcgcagatg ggagctgtcc atggtctgga gctcccgcgg 8280
 cgtcaggta ggcgggagct cctgcaggtt tacctcgcat agacgggtca ggcgcggggc 8340
 tagatccagg tgatacctaa tttccagggg ctggttggtg gcggcgtcga tggcttgcaa 8400
 gaggcggcat cccgcggcg cgactacggt accgcgcggc gggcgggtgg ccgcgggggt 8460
 gtccttgat gatgcatcta aaagcgggtg cgcgggcgag ccccgaggag tagggggggc 8520
 tccggaccgg ccgggagagg ggcgaggggc acgtcggcg cgcgcgcggg caggagctgg 8580
 tgctgcgcgc gtaggttgct ggcgaacgcg acgacgcggc ggtgatctc ctgaatctgg 8640
 cgctctgctg tgaagacgac gggcccggtg agcttgagcc tgaagagag ttcgacagaa 8700
 tcaatttcgg tctgcttgac ggcggcctgg cgcaaatct cctgcacgtc tcttgagttg 8760
 tcttgatagg cgatctcggc catgaactgc tcatctctt cctcctggag atctcccgct 8820
 ccggtcgtct ccacgggtggc ggcgaggtcg ttgaaatgc gggccatgag ctgcgagaag 8880
 gcgttgagcg ctccctcgtt ccagacgcgg ctgtagacca cgcccttcc ggcatcggcg 8940
 gcgcgcatga ccacctgcgc gagattgagc tccacgtgcc gggcgaagac ggcgtagttt 9000
 cgacggcgct gaaagaggtg gttgaggggt gtggcggtgt gttctgccac gaagaagtac 9060
 ataaccacgc gtcgcaacgt ggattcgttg atatcccca aggcctcaag gcgctccatg 9120
 gcctcgtaga agtccacggc gaagttgaaa aactggaggt tgcgcgcgca cagggttaa 9180
 tctctctcca gaagacggat gactcggcg acagtgtcgc gcacctcgcg ctcaaaggct 9240
 acaggggcct ctctctctt ttcaatctcc tcttcataa gggcctcccc tcttctctt 9300
 tctggcgcg gtgggggagg ggggacacgg cgcgacgac ggcgcaccgg gaggcggtcg 9360
 acaaagcgct cgatcatctc ccgcggcgga cgcgcgatgg tctcggtagc ggcgcggcgg 9420
 tctcgcgggg ggcgcagttg gaagacgcgc ccgctcatgt ccgggttatg ggttggcggt 9480
 gggctgccat gcggcaggga tacggcgcta acgatgcac tcaacaattg ttgtgtaggt 9540
 actccgcgc cgagggacct gagcgagtc gcacgacgg gatcgaaaa cctctcgaga 9600
 aaggcgtcta accagtcaca gtcgcaaggt aggctgagca ccgtggcggg cgcgcagcgg 9660
 ggcgggtcgg ggttggttct ggcggaggtg ctgctgatga tgaattaaa gtaggcggtc 9720
 ttgagacggc ggttggtcga cagaagcacc atgtccttgg gtccggcctg ctgaatgcgc 9780
 aggcggtcgg ccattgccca ggcttcgttt tgacatcggc gcaggtcttt gtatagttct 9840
 tgcatgagcc tttctaccgg cacttcttct tctccttct cttgtcttgc atctcttga 9900
 tctatcgtcg cgcgcggcggc ggagtttggc cgtaggtggc gccctcttcc tcccatgcgt 9960
 gtgaccccg agccctcat cggctgaagc agggctaggt cggcgacaac gcgctcggct 10020
 aatatggcct gctgcacctg cgtgagggtg gactggaagt catccatgtc cacaaagcgg 10080
 tggtagtcgc ccgtgttgat ggtgtaagtg cagttggcca taacggacca gttaacggtc 10140
 tggtagcccg gctgcgagag ctccggtgtac ctgagacgc agtaagccct cgagtcaa 10200
 acgtagtctg tgcaagtccg caccaggtac tggtagtcca ccaaaaagt cggcgcggtc 10260
 tggcggtaga ggggacagcg taggggtggc ggggtctcgg gggcgagatc ttccaacata 10320
 aggcgatgat atccgtagat gtacctggac atccaggtga tgcggcgggc ggtggtgag 10380
 gcgcgcggaa agtcgcggag gcggttccag atgttgcgca gcggcaaaaa gtgctccatg 10440
 gtcgggagcg tctggccggt caggcgcgcg caatcggtga cgtcttagcg tgcaaaagga 10500
 gagcctgtaa gcgggcactc ttccgtggtc tggtagataa attcgcaagg gtatcatggc 10560
 ggacgaccgg ggttcgagcc ccgtatccgg ccgtcccgcg tgatccatgc ggttaccgcc 10620
 cgctgtcga acccaggtgt gcgacgtcag acaacggggg agtgctcctt ttggttctct 10680
 tccaggcgcg gcggctgctg cgtagcctt tttggccact ggcgcgcgc agcgtaagcg 10740
 gttaggctgg aaagcgaaag catlaagtgg ctgcctcct gtacgggag ggttatctt 10800
 caagggttga gtcgcgggac ccccggttcg agtctcggac cggccggact gcggcgaacg 10860
 ggggtttgcc tccccgtcat gcaagacccc gcttgcaaat tctccggaa acagggacga 10920
 gccccctttt tgcttttccc agatgcatcc ggtgctgcgg cagatgcgcc cccctctca 10980
 gcacgggcaa gagcaagagc agcggcagac atgcagggca cctcccctc ctctaccgc 11040
 gtcaggagg gcgacatccg cggttgacgc ggcagcagat ggtgattacg aacccccgcg 11100
 gcgcggggcc cggcactacc tggacttgga ggaggcgag ggcctggcg gcctaggagc 11160
 gccctctcct gagcggatcc caagggtgca gctgaagcgt gatacgctg aggcgtacgt 11220
 gccgcggcag aacctgttcc gcgaccgca gggagaggag cccgaggaga tgcgggagc 11280
 aaagttccac gcagggcgcg agctgcggca tggcctgaat cgcgagcggg tgcgtgcga 11340
 ggaggacttt gagcccgacg cgcgaaccgg gattagctcc gcgcgcgcac acgtggcggc 11400
 cgccgacctg gtaaccgat acgagcagac ggtgaaccag gagattaact ttcaaaaaag 11460
 cttaacaac cagtgctgta cgcttggtgc gcgcgaggag gtggctatag gactgatgca 11520
 tctgtgggac tttgtaagcg cgctggagca aaacccaaat agcaagccgc tcatggcgca 11580
 gctgttctct atagtgcagc acagcaggga caacgaggca ttcagggatg cgctgctaaa 11640
 catagtagag cccgagggcc gctggctgct cgatttgata aacatcctgc agagcatagt 11700

ggtgcaggag	cgcagcttga	gcctggctga	caaggtggcc	gccatcaact	attccatgct	11760
tagcctgggc	aagttttacg	cccgcaagat	ataccatacc	ccttacgttc	ccatagacaa	11820
ggaggtaaa	atcgaggggt	tctacatgcg	catggcgctg	aaggtgctta	ccttgagcga	11880
cgacctgggc	gtttatcgca	acgagcgcat	ccacaaggcc	gtgagcgatg	gccggcgcg	11940
cgagctcagc	gaccgcgagc	tgatgcacag	cctgcaaaag	gccctggctg	gcacgggcag	12000
cggcgataga	gaggccgagt	cctactttga	cgcgggcgct	gacctgcgct	gggcccgaag	12060
ccgacgcgcc	ctggagcgag	ctggggccgg	acctgggctg	gcggtggcac	ccgcgcgcgc	12120
tggcaacgtc	ggcgggctgg	aggaatatga	cgaggacgat	gagtacgagc	cagaggacgg	12180
cgagtactaa	gcggtgatgt	ttctgatcag	atgatgcaag	acgcaacgga	cccggcggtg	12240
cggggcgcg	tgcagagcca	gccgtccggc	cttaactcca	cggacgactg	gcgccaggtc	12300
atggaccgca	tcatgtcgct	gactgcgcgc	aatcctgacg	cgttccggca	gcagccgcag	12360
gccaaccggc	tctccgcaat	tctggaagcg	gtggtccggg	cgcgcgcaaa	ccccacgcac	12420
gagaagggtg	tggcgatcgt	aaacgcgctg	gccgaaaaca	gggccatccg	gcccagcgag	12480
gccggcctgg	tctacgacgc	gctgcttcag	cgcggtggct	gttacaacag	cggcaacgtg	12540
cagaccaaac	tggaccggct	ggtgggggat	gtgcgcgagg	ccgtggcgca	gcgtgagcgc	12600
gcgcagcagc	agggcaacct	gggtccatg	gttgactata	acgccttcct	gagtacacag	12660
cccgcacaag	tgccgcgggg	acaggaggac	tacaccaact	ttgtgagcgc	actgcggcta	12720
atggtgactg	agacaccgca	aagtgaagtg	taccagtctg	ggccagacta	ttttttccag	12780
accagtagac	aaggcctgca	gaccgtaaac	ctgagccagg	ctttcaaaaa	cttgacgggg	12840
ctgtgggggg	tgccggctcc	cacagcgac	cgcgcgaccg	tgtctagctt	gctgacgccc	12900
aactcgcg	tggtgctgct	gctaatacgc	cccttcacgg	acagtggcag	cgtgtcccg	12960
gacacatacc	taggtcactt	gctgacactg	taccgcgagg	ccataggtca	ggcgcatgtg	13020
gacgagcata	ctttccagga	gattacaagt	gtcagccg	cgctggggca	ggaggacacg	13080
ggcagcctgg	aggcaacctt	aaactacctg	ctgaccaacc	ggcggcagaa	gatccccctg	13140
ttgcacagtt	taaacagcga	ggaggagcgc	atlttgcgct	acgtgcagca	gagcgtgagc	13200
cttaacctga	tgcgcgacgg	ggtaacgccc	agcgtggcgc	tggacatgac	cgcgcgcaac	13260
atggaaccgg	gcatgtatgc	ctcaaacggg	ccgtttatca	accgccta	ggactacttg	13320
catcgcgcg	ccgcccgtga	ccccgagtat	ttcaccaatg	ccatcttgaa	cccgcactgg	13380
ctaccgcccc	ctggtttcta	caccggggga	ttcgaggtgc	ccgagggtaa	cgatggattc	13440
ctctgggacg	acatagacga	cagcgtgttt	tccccgcaac	cgagaccctt	gctagagttg	13500
caacagcgcg	agcaggcaga	ggcggcgctg	cgaagggaaa	gcttccgcag	gccaagcagc	13560
ttgtccgatc	tagggcgctg	ggccccgcg	tcagatgcta	gtagccattt	tccaagcttg	13620
atagggtctc	ttaccagcac	tcgcaccacc	cgccccgcgc	tgtgtggcga	ggaggagtac	13680
ctaaacaact	cgctgctgca	gccgcagcgc	gaaaaaaacc	tgctccggc	atttcccaac	13740
aacgggatag	agagcctagt	ggacaagatg	agtagatgga	agacgtacgc	gcaggagcac	13800
agggacgtgc	caggcccgcg	cccgcaccac	cgctgcataa	ggcacgaccg	tcagcggggt	13860
ctggtgtggg	aggacgatga	ctcggcagac	gacagcagcg	tcctggattt	gggaggagtg	13920
ggcaaccctg	ttgcgcacct	tcgcccagg	ctggggagaa	tgttttaaaa	aaaaaaaaag	13980
atgatgcaaa	ataaaaaact	caccaaggcc	atggcaccga	gcgttggttt	tcttgatttc	14040
cccttagtat	gcggcgcgcg	gcgatgtatg	aggaaggtcc	tcctccctcc	tacgagagtg	14100
tggtagcgcg	ggcgccagtg	gcggcgcgcg	tggtttctcc	cttcgatgct	cccctggacc	14160
cgccgtttgt	gcctccgctg	tacctgcggc	ctaccggggg	gagaaacagc	atccgttact	14220
ctgagttggc	acccttatcc	gacaccaccc	gtgtgtacct	ggtggacaac	aagtcaacgg	14280
atgtggcatc	cctgaactac	cagaacgacc	acagcaactt	tctgaccacg	gtcattcaaa	14340
acaatgacta	cagcccgggg	gaggcaagca	cacagaccat	caatcttgac	gaccggctcg	14400
actggggcg	cgacctgaaa	accatcctgc	ataccaacat	gccaaatgtg	aacgagttca	14460
tgtttaacaa	taagtttaag	gcgcggtgta	tggtgtcgcg	cttgcttact	aaggacaatc	14520
aggtggagct	gaaatacgag	tgggtggagt	tcacgctgcc	cgagggcaac	tactccgaga	14580
ccatgaccat	agaccttatg	aacaacgcga	tcgtggagca	ctacttgaaa	gtgggcagac	14640
agaacggggt	tctggaaaag	gacatcgggg	taaagtttga	caccgcgaac	ttcagactgg	14700
ggtttgaccc	cgctactggg	cttgctcatg	ctgggggtata	tacaaacgaa	gccttccatc	14760
cagacatcat	tttgctgcca	ggatgcgggg	tggacttcac	ccacagccgc	ctgagcaact	14820
tggtgggcat	ccgcaagcgg	caacccttcc	aggagggtct	taggatcacc	tacgatgatc	14880
tggagggtgg	taacattccc	gcactgttgg	atgtggacgc	ctaccaggcg	agcttgaaag	14940
atgacaccga	acagggcggg	ggtggcgag	gcggcgagaa	cagcagtggc	agcggcgcg	15000
aagagaactc	caacgcggca	gccgcggcaa	tgacgcccgt	ggaggacatg	aacgatcatg	15060
ccattcgcg	cgacaccttt	gccacacggg	ctgaggagaa	gcgcgctgag	gccgaagcag	15120
cggccgaagc	tgccgcccc	gctgcgcaac	ccgaggtcga	gaagcctcag	aagaaaccgg	15180
tgatcaaaac	cctgacagag	gacagcaaga	aacgcagtta	caaccttaata	agcaatgaca	15240
gcaccttcac	ccagtaccgc	agctgtgtacc	ttgcatacaa	ctacggcgac	cctcagaccg	15300
gaatccgctc	atggaccctg	ctttgcactc	ctgacgtaac	ctgcggctcg	gagcaggtct	15360
actggtcggt	gccagacatg	atgcaagacc	ccgtgacctt	ccgctccacg	cgccagatca	15420
gcaacttttc	ggtggtgggc	gccgagctgt	tgcccgtgca	ctccaagagc	ttctacaacg	15480
accaggccgt	ctactcccaa	ctcatccgcc	agtttacctc	tctgaccac	gtgttcaatc	15540
gctttccga	gaaccagatt	ttggcgcgcc	cgccagcccc	caccatcacc	accgtcagtg	15600
aaaacgttcc	tgctctcaca	gatcacggga	cgctaccgct	gcgaacagc	atcggaggag	15660

```

tccagcgagt gaccattact gacgccagac gccgcacctg cccctacggt tacaaggccc 15720
tgggcatagt ctcgccgcgc gtccatcga gccgcacttt ttgagcaagc atgtccatcc 15780
ttatatcgcc cagcaataac acaggctggg gcttgccgtt cccaagcaag atgtttggcg 15840
gggccaagaa gcgctccgac caacaccagc tgcgcgtgcg cgggcactac cgcgccct 15900
ggggcgcgca caaacgcggc cgactgggc gcaccaccgt cgatgacgcc atcgacgcgg 15960
tggtggagga ggccgcgaac tacacgccca gcgcgccacc agtgtccaca gtggacgcgg 16020
ccattcagac cgtggtgcmc ggagcccggc gctatgctaa aatgaagaga cgccggaggg 16080
gcgtagcacg tcgccaccgc cgccgaccgc gcaactgccc ccaacgcgcg gcggcgcccc 16140
tgcttaaccg cgcacgtcgc accggccgac gggcgcccat gcgggcccgt cgaaggctgg 16200
ccgcgggtat tgtcactgtg ccccccaggt ccaggcgacg agcggccgcc gcagcagccg 16260
cggccattag tgctatgact cagggtcgca ggggcaacgt gtattgggtg cgcgactcgg 16320
ttagcggcct gcgctgccc gtgcgaccc gcccccgcg caactagatt gcaagaaaaa 16380
actactaga ctcgtactgt tgtatgtatc cagcggcgcc ggccgcgaac gaagctatgt 16440
ccaagcgcaa aatcaaaaga gagatgctcc aggtcatcgc gccggagatc tatggccccc 16500
cgaagaagga agagcaggat tacaagcccc gaaagctaaa gcgggtcaaa aagaaaaaga 16560
aagatgatga tgatgaactt gacgacgagg tggaaactgt gcacgctacc gcgccaggcg 16620
gacgggtaca gtgaaaaggt cgacgcgtaa aacgtgtttt gcgacccggc accaccgtag 16680
tctttacgcc cggtagcgcc tccacccgca cctacaagcg cgtgtatgat gagggtgtacg 16740
gcgacgagga cctgcttgag caggccaacg agcgccctcg ggagtttgcc tacggaaaagc 16800
ggcataagga catgctggcg ttgccgtgg acgagggcaa cccaacacct agcctaaagc 16860
ccgtaacact gcacgaggtg ctcgccgcgc ttgcaccgtc cgaagaaaag cgcgccctaa 16920
agcgcgagtc tggtagcttg gcacccaccg tgcagctgat ggtacccaag cgccagcgac 16980
tggaagatgt cttgaaaaaa atgaccgtgg aacctgggct ggagcccag gtccgcgtgc 17040
ggccaatcaa gcaggtggcg ccgggactgg gcgtgcagac cgtggacgtt cagataccca 17100
ctaccagtag caccagtatt gccaccgcca cagaggcat ggagacaaa acgtccccgg 17160
ttgcctcagc ggtggcggtg gcccggtgc agcggtcgc tgcggccgcg tccaagacct 17220
ctacggaggt gcaaacggac ccgtggatgt ttccgcttc agccccccg cgcccgcgcg 17280
gttcgagga gtacggcgcc gccagcgcg cactgccga atatgcccta catccttcca 17340
ttgcgctac ccccggtat cgtggctaca cctaccgccc cagaagacga gcaactacc 17400
gacgccgaac caccactgga acccgccgcc gccgtcgccg tcgccagccc gtgctggccc 17460
cgatttccgt gcgcaggggt gtcgcgaag gaggcaggac cctggtgctg ccaacagcgc 17520
gtaccacccc cagcatcgtt taaaagccgg tctttgtggt tcttgagat atggccctca 17580
cctgcgcct ccgtttcccg gtgcgggat tccaggaag aatgcaccgt aggaggggca 17640
tgcccgcca cgccctgacg ggccgcatgc gtcgtgcga ccaccggcg cgcgcgcg 17700
cgccacgtcg catgcgcggc ggtatcctgc cctccttat tccactgat gcccgcgga 17760
ttggcgccgt gcccggaatt gcacccgtgg ccttgacggc gcagagacac tgattaaaaa 17820
caagttgat gtgaaaaaat caaaataaaa agtctggact ctcacgctcg cttggtcctg 17880
taactatttt gtagaatgga agacatcaac tttcgcttc tggccccgcg acacggctcg 17940
cgccggttca tggaaaactg gcaagatata ggcaccagca atatgagcg tggcgcttc 18000
agctggggct cgctgtggag cggcattaaa aatttcggtt ccaccgttaa gaactatggc 18060
agcaaggcct ggaacagcag cacaggccag atgctgaggg ataagttgaa agagcaaaa 18120
ttccaacaaa agtggtgtag tggcctggcc tctggcatta gcggggtggt ggacctggcc 18180
aaccagcgag tgcaaaaata gattaacagt aagcttgatc cccgccctcc cgtagaggag 18240
cctccaccgg ccgtggagac agtgtctcca gagggcgctg gcgaaaagcg tccgcgcccc 18300
gacagggaa gaaactctgt gacgcaata gacgagcctc cctcgtagca ggaggcacta 18360
aagcaaggcc tgcccaccac ccgtcccat gcgcccagtg ctaccggagt gctgggcca 18420
cacacaccgg taacgctgga cctgcctccc cccgcgaca cccagcagaa acctgtgctg 18480
ccaggcccga ccgcccgtgt tgtaacccgt cctagccgcg cgtccctgcg ccgcgcccgc 18540
agcggctccg gatcgttgcg gcccgtagcc agtggaact ggcaaaagcac actgaacagc 18600
atcgtgggtc tgggggtgca atccctgaag gcggacgat gcttctgaat agctaactgt 18660
tcgtatgtgt gcatgtatg cgtccatgtc gccgccagag gagctgctga gccgcgcgc 18720
gcccgcttcc caagatggct accccttcga tgatgccga gtggtcttac atgcacatct 18780
cgggccagga cgccctggag tacctgagcc ccgggctggt gcagtttgcc cgcgccaccg 18840
agacgtactt cagcctgaat aacaagttta gaaacccac ggtggcgccct acgcacgacg 18900
tgaccacaga ccggtcccag cgtttgacgc tgcggttcat ccctgtggac cgtgaggata 18960
ctgcgtactc gtacaaggcg cggttcacc tagctgtggg tgataaccgt gtgctggaca 19020
tggttccac gtactttgac atccgcggcg tgctggacag gggccctact ttaagccct 19080
actctggcac tgcctacaac gccctggctc ccaaggggtg cccaatcct tgcaatggg 19140
atgaagctgc tactgtctt gaaataaacc tagaagaaga ggacgatgac aacgaagacg 19200
aagtagacga gcaagctgag cagcaaaaaa ctcacgtatt tggcgaggcg ccttattctg 19260
gtataaatat tacaaggag ggtattcaaa taggtgtcga aggtcaaca cctaaatatg 19320
ccgataaaac atttcaacct gaacctcaaa taggagaatc tcagtggtac gaaactgaaa 19380
ttaatcatgc agctgggaga gtcttaaaaa agactacccc aatgaaacca tgttacggtt 19440
catatgcaaa acccacaat gaaaatggag ggcaaggcat tcttgtaaa caacaaaatg 19500
gaaagctaga aagtcaagtg gaaatgcaat ttttctcaac tactgaggcg accgcaggca 19560
atggtgataa cttgactcct aaagtggat tgtacagtga agatgtagat atagaaaccc 19620

```

cagacactca tatttcttac atgcccacta ttaaggaagg taactcacga gaactaatgg 19680
 gccacaacatc tatgcccac aggcctaatt acattgcttt tagggacaat tttattggtc 19740
 taatgtatta caacagcacg ggtaatatgg gtgttctggc gggccaagca tcgcagttga 19800
 atgctgttgt agatttgcaa gacagaaaca cagagctttc ataccagctt ttgcttgatt 19860
 ccattggtga tagaaccagg tacttttcta tgtggaatca ggctgttgac agctatgac 19920
 cagatgttag aattattgaa aatcatggaa ctgaagatga acttccaaat tactgctttc 19980
 cactggggagg tgtgattaat acagagactc ttaccaaggt aaaacctaata acaggtcagg 20040
 aaaatggatg ggaaaaagat gctacagaat ttccagataa aaatgaaata agagttggaa 20100
 ataattttgc catggaaatc aatctaaatg ccaacctgtg gagaaatttc ctgtactcca 20160
 acatagcgct gtatttgccc gacaagctaa agtacagtc ttccaacgta aaaatttctg 20220
 ataaccctaa cacctacgac tacatgaaca agcgagtggt ggctcccggg ttagtgagct 20280
 gctacattaa ccttggaagca cgctgggtccc ttgactatat ggacaacgtc aacctattta 20340
 accaccaccg caatgctggc ctgcgtacc gctcaatgtt gctgggcaat ggtcgctatg 20400
 tgcccttcca catccaggtg cctcagaagt tctttgcat taaaaacctc ctctcctgc 20460
 cgggctcata cacctacgag tggaaactca ggaaggatgt taacatggtt ctgcagagct 20520
 ccctaggaaa tgacctaaagg gttgacggag ccagcattaa gtttgatagc atttgctttt 20580
 acgccacctt ctccccatg gccacaaca ccgcctccac gcttgaggcc atgcttagaa 20640
 acgacaccaaa cgaccagtc ttaacgact atctctccgc cgccaacatg ctctacccta 20700
 taccgcctaa cgctaccaac gtgcccata ccatccctc ccgcaactgg gcggcttcc 20760
 gcggctgggc cttcacgcgc ctttaagacta aggaaccccc atcactgggc tcgggctacg 20820
 acccttatta cactactct gctctatac cctacctaga tggaaacctt tacttcaacc 20880
 acacctttaa gaagggtggc attaccttg actcttctgt cagctggcct ggcaatgacc 20940
 gcctgtctac cccaacgag ttgaaatta agcgctcagt tgacggggag ggttacaacg 21000
 ttgcccagtg taacatgacc aaagactggt tcctggtaca aatgctagct aactacaaca 21060
 ttggctacca gggcttctat atcccagaga gctacaagga ccgcatgtac tccttcttta 21120
 gaaacttcca gcccatgagc cgctcaggtg tggatgatac taaatacaag gactaccaac 21180
 aggtgggcat cctacacca cacaacaact ctggatttgt tggtacctt gccccacca 21240
 tgccgcaagg acaggcctac cctgctaact tccccatcc gcttataggc aagaccgag 21300
 ttgacagcat taccagaaa aagtttctt gcgacgcac cctttggcgc atccattct 21360
 ccagtaactt tatgtccatg ggcgactca cagacctggg ccaaaacctt ctctacgcca 21420
 actccgcccc cgcgctagac atgacttttg aggtggatcc catggacgag cccaccttc 21480
 tttatgtttt gtttgaagtc tttgacgtg tcctgtgtca ccggccgcac cgcgcgctca 21540
 tcgaaacctg gtacctgcgc acgcccttct cgcccgcaa cgccacaaca taaagaagca 21600
 agcaacatca acaacagctg ccgcatggg ctccagtgag caggaaactga aagccattgt 21660
 caaagatctt ggttgtgggc catattttt gggcacctat gacaagcgtt ttccaggctt 21720
 tgtttctcca cacaagctcg cctgcgcat agtcaatag ccggtcgcg agactggggg 21780
 cgtacactgg atggcctttg cctggaaccc gcaactcaaaa acatgctacc tctttgagcc 21840
 ctttggcttt tctgaccagc gactcaagca ggtttaccag ttgagtagc agtcaactct 21900
 gcgcgtagc gccattgctt cttccccga ccgctgtata acgctggaaa agtccacca 21960
 aagcgtacag gggcccaact cgcccgctg tggactattc tgctgcatgt ttctccacgc 22020
 ctttgccaac tggcccaaaa ctcccatgga tcacaacccc accatgaacc ttattaccgg 22080
 ggtaccaaac tccatgctca acagtccca ggtacagccc accctgcgtc gcaaccagga 22140
 acagctctac agcttctgg agcgccactc gccctacttc cgagccaca gtgcgcagat 22200
 taggagcgcc acttctttt gtcacttgaa aaacatgtaa aaataatgta ctagagacac 22260
 tttcaataaa ggcataatgct tttatttgta cactctcggg tgattattta cccccacct 22320
 tgccgtctgc gccgtttaa aatcaaagg gttctgccgc gcatcgctat gcgccactgg 22380
 cagggacacg ttgcgatact ggtgttagt gctccactta aactcaggca caacctcgg 22440
 cggcagctcg gtgaagttt cactccacag gctgcgcacc atcaccaacg cgttagcag 22500
 gtcggcgccc gatattctga agtcgcagtt ggggectccg ccctgcgcgc gcgagttgcg 22560
 atacacaggg ttgcagcact ggaacactat cagcgccggg tgggtgcacgc tggccagcac 22620
 gctctgttcg gagatcagat ccgcgtccag gtcctccgcg ttgctcaggc cgaacggagt 22680
 caactttggt agctgccttc ccaaaaagg cgctgcccc ggctttgagt tgcaactcga 22740
 ccgtagtggt atcaaaagg gaccgtgccc ggtctggcg ttaggataca gcgcctgcat 22800
 aaaagccttg atctgcttaa aagccacctg agcctttgcg ctttcagaga agaacatgcc 22860
 gcaagacttg ccggaaaact gattggccgg acaggccgcg tcgtgcacgc agcaccttgc 22920
 gtcggtgttg gagatctgca ccacatttcg gccccaccgg ttcttcacga tcttggcctt 22980
 gctagactgc tccttcagcg cgcgctgcc gtttctgcgc gtcacatcca tttcaatcac 23040
 gtgctcctta tttatcataa tgcttccgtg tagacactta agctcgctt cgatctcagc 23100
 gcagcggtgc agccacaacg cgagcccggt gggctcgtga tgctttagg tcacctctgc 23160
 aaacgactgc aggtacgct cgaggaatcg ccccatcatc gtcacaaaagg tcttgggtct 23220
 ggtgaaggtc agctgcaacc cgcggtgctc ctggttcagc caggctcttc atacggccgc 23280
 cagagcttcc acttggtcag gcagtagttt gaagttcgcc ttagatcgt tatccacgtg 23340
 gtactgttcc atcagcgcg cgcgagcctc catgcccttc tcccacgag acacgatcgg 23400
 cacactcagc gggttcatca ccgtaatttc actttccgct tcgctgggct ctctctctc 23460
 ctcttcgctc cgcataccac cgccactgg gtcgtcttca ttcagccgc gcactgtgcg 23520
 cttacctctt ttgcatgct tgattagcac cggtgggtg ctgaaacca ccattttag 23580

cgccacatct tctcttttct cctcgtgtgc cagcattacc tctggtgatg gcgggcgctc 23640
 gggtctggga gaagggcgct tcttttttct cttggggcga atgggccaat ccgccgcgca 23700
 ggtcgtatggc cgcgggctgg gtgtgcgcgg caccagcgcg tcttgtgatg agtcttcttc 23760
 gtctctcgac tcgatacgcc gcctcatccg ctttttttgg ggcgcggggg gaggcgcgcg 23820
 cgacggggac ggggacgaca cgtcctccat ggttggggga cgtcgcgcgg caccgcgtcc 23880
 gcgctcgggg gtggttttcg cgtcctcctc ttcccgactg gccatttctt tctcctatag 23940
 gcagaaaaag atcatggagt cagtcgagaa gaaggacagc ctaaccgccc cctctgagtt 24000
 cgccaccacc gcctccaccg atgcgcgcaa cgcgcctacc accttccccg tcgaggcacc 24060
 ccgccttgag gaggaggaag tgattatcga gcaggacca ggttttgtta gcgaagacga 24120
 cgaggaccgc tcagtaccaa cagaggataa aaagcaagac caggacaacg cagaggcaaa 24180
 cgaggaaacaa gtcggggcgg gggacgaaag gcatggcgac tacctagatg tgggagacga 24240
 cgtgctgttg aagcatctgc agcgccagtg cgcattatc tgcgacgcgt tgcaagagcg 24300
 cagcgatgtg cccctcgcca tagcgatgt cagccttgcc tacgaacgcc acctattctc 24360
 accgcgcgta ccccccaaac gccaaagaaa cggcacatgc gagcccaacc cgcgcctcaa 24420
 cttctacccc gtatttgccg tgccagaggt gcttgccacc tatcacatct ttttccaaaa 24480
 ctgcaagata cccctatcct gccgtgccaa ccgcagccga gcggacaagc agctggcctt 24540
 gcggcagggc gctgtcatac ctgatatcgc ctcgctcaac gaagtggcaa aaatctttga 24600
 ggttcttggg cgcgacgaga agcgcgcggc aaacgctctg caacaggaaa acagcgaaaa 24660
 tgaagtcac tctgagtggt tgggtgaaact cgagggtgac aacgcgcgcc tagccgtact 24720
 aaaaacgagc atcgaggtca cccactttgc ctaccggca cttaacctac cccccaaggt 24780
 catgagcaca gtcagtgatg agctgatcgt gcgcgctgc cagcccttg agagggtgc 24840
 aaatttgcaa gaacaaacag aggagggcct acccgagtt ggcgacgagc agctagcgcg 24900
 ctggcttcaa acgcgcgagc ctgcccactt ggaggagcga cgcaaaacta tgatggccgc 24960
 agtgctcgtt accgtggagc ttgagtgcat gcagcggttc ttgtctgacc cggagatgca 25020
 gcgcaagcta gaggaacat tgcactacac ctttcgacag ggctacgtac gccaggcctg 25080
 caagatctcc aacgtggagc tctgcaacct ggtctcctac cttggaattt tgacgaaaaa 25140
 ccgccttggg caaaacgtgc ttcatccac gctcaagggc gaggcgcgcc gcgactacgt 25200
 ccgcgactgc gtttacttat ttctatgcta cacctggcag acggccatgg gcgtttggca 25260
 gcagtgcttg gaggagtga acctcaagga gctgcagaaa ctgctaaagc aaaacttgaa 25320
 ggacctatgg acggccttca acgagcgctc cgtggccgcg cacctggcgg acatcatttt 25380
 ccccgaaacgc ctgcttaaaa ccctgcaaca gggctcgcca gacttcacca gtcaaagcat 25440
 gttgcagaac tttaggaact ttatcctaga gcgctcagga atcttgcccg ccacctgctg 25500
 tgcaacttct agcgactttg tgcccattaa gtaccgcgaa tgccctccgc cgctttgggg 25560
 ccaactgtac cttctgcagc tagccaacta ccttgccctac cactctgaca taatggaaga 25620
 cgtgagcggg gacggtctac tggagtgatc ctgtcgtgc aacctatgca ccccgaccg 25680
 ctccctggtt tgcaattcgc agctgcttaa cgaaagtcaa attatcggtt cctttgagct 25740
 gcaggggtccc tcgcctgacg aaaaagtcgc ggctccgggg ttgaaactca ctccggggct 25800
 gtggacgtcg gcttaccttc gcaaatttgt acctgaggac taccacgccc acgagattag 25860
 gttctacgaa gaccaatccc gcccgccaaa tgcgagcgtt accgcctgcy tcattaccca 25920
 gggccacatt cttggccaat tgcaagccat caacaagacc cgccaagagt ttctgctacg 25980
 aaaggagcgg ggggtttact tggacccccca gtccggcgag gagctcaacc caatcccccc 26040
 gccgcgcgag ccctatcagc agcagccgcg ggccttgct tcccaggatg gcacccaaaa 26100
 agaagtcgca gctgcgcggc ccacccacgg acgaggagga atactgggac agtcaggcag 26160
 aggaggtttt ggacgaggag gaggaggaca tgatggaaga ctgggagagc ctgacgaggg 26220
 aagcttccga ggtcgaagag gtgtcagacg aaacaccgtc accctcggtc gcattcccc 26280
 cgccggcgcc ccagaaatcg gcaaccggtt ccagcatggc tacaacctcc gctcctcagg 26340
 ccgcgcgggc actgcccgtt cgcgcgacca accgtagatg ggacaccact ggaaccaggg 26400
 ccggtaagtc caagcagccg ccgcccgttag cccaagagca acaacagcgc caaggctacc 26460
 gctcatggcg cgggcacaa gacgccatag ttgcttgctt gcaagactgt gggggcaaca 26520
 tctccttcgc ccgcccgttt cttctctacc atcacggcgt ggccttcccc cgtaacatcc 26580
 tgcattacta ccgtcatctc tacagcccat actgcaccgg cggcagcggc agcggcagca 26640
 acagcagcgg ccacacagaa gcaaaggcga ccggatagca agactctgac aaagcccaag 26700
 aaatccacag cggcggcagc agcaggagga ggagcgctgc gtctggcgcc caacgaacc 26760
 gtatcgaccc gcgagcttag aaacaggatt tttcccactc tgatgtctat atttcaacag 26820
 agcagggggc aagaacaa gctgaaaata aaaaacaggt ctctgcgac cctcaccgcg 26880
 agctgcctgt atcacaaa gcaagatcag cttcggcgca cgctggaaga cgcggaggct 26940
 ctcttcagta aatactgcgc gctgactctt aaggactagt ttcgcgccct ttctcaaat 27000
 taagcgcgaa aactacgtca tctccagcgg ccacaccgg cgccagcacc tgctgtcagc 27060
 gccattatga gcaaggaaat tcccacgccc tacatgtgga gttaccagcc acaaatggga 27120
 cttgcggctg gagctgcccc agactactca accgaataa actacatgag cgcgggaccc 27180
 cacatgatat ccggggtcaa cggaatccgc gcccaccgaa accgaattct cttggaacag 27240
 gcggctatta ccaccacacc tcgtaataac cttaatcccc gtagttggcc cgctgccttg 27300
 gtgtaccagg aaagtcccg tcccaccact gtggtacttc ccagagacgc ccaggccgaa 27360
 gttcagatga ctaactcagg ggcgcagctt cggggcggtt ttcgtcacag ggtgcggctg 27420
 cccgggcagc gctgacaatc agaggcgag gtattcagct caacgacgag 27480
 tcggtgagct cctcgttggt tctccgtccg gacgggacat ttcagatcgg cggcgccggc 27540

```

cgctccttcat tcacgcctcg tcaggcaatc ctaactctgc agacctcgtc ctctgagccg 27600
cgctcctggag gcattggaac tctgcaatth attgaggagt ttgtgccatc ggtctacttt 27660
aacccttctt cgggacctcc cggccactat ccggatcaat ttattcctaa ctttgacgcg 27720
gtaaaaggact cggcggaacg ctacgactga atgttaagtg gagaggcaga gcaactgcgc 27780
ctgaaacacc tgggtccactg tcgcccgcac aagtgccttg ccgcgcactc cggtgagttt 27840
tgctactttg aattgcccga ggatcatatc gaggggcccg cgcacggcgt ccggcttacc 27900
gcccaggagg agcttgcccg tagcctgatt cgggagttta cccagcgccc cctgctagtt 27960
gagcgggaca ggggaccctg tgttctcact gtgatttgca actgtcctaa cttggatta 28020
catcaagatc tttgttgcca tctctgtgct gagtataata aatacagaaa ttaaaatata 28080
ctggggctcc tatcgccatc ctgtaaacgc caccgtcttc acccgcccaa gcaaaccaag 28140
gcgaacctta cctggacttt ttaacatctc tccctctgtg atttacaaca gtttcaaccc 28200
agacggagtg agtctacgag agaacctctc cgagctcagc tactccatca gaaaaaacac 28260
caccctcctt accctgcggg aacgtacgag tgcgtcaccc gccgctgcac cacacctacc 28320
gcctgaccgt aaaccagact tttccggac agacctcaat aactctgttt accagaacag 28380
gaggtgagct tagaaaaacc ttagggattt aggccaaagg cgcagctact gtggggttta 28440
tgaacaattc aagcaactct acgggctatt ctaattcagg ttctctaga agtcaggctt 28500
cctggatgtc agcatctgac tttggccagc acctgtcccg cggatttgtt ccagtccaac 28560
tacagcgacc caccctaaca gagatgacca acacaaccaa cgcggccgcc gctaccggac 28620
ttacatctac cacaatatca cccaagtth ctgcctttgt caataactgg gataacttgg 28680
gcatgtggtg gttctccata gcgcttatgt ttgtatgcct tattattatg tggctcatct 28740
gctgcctaaa gcgcaaacgc gcccgaccac ccatctatag tcccatcatt gtgctacacc 28800
caaacatga tggaatccat agattggacg gactgaaaca catgttcttt tctcttacag 28860
tatgattaaa tgagatctag aaatggacgg aattattaca gagcagcgcc tgctagaaag 28920
acgcagggca gcggccgagc aacagcgcat gaatcaagag ctccaagaca tgggttaactt 28980
gcaccagtgc aaaagggtta tcttttgtct ggtaaagcag gccaaagtca cctacgacag 29040
taataccacc ggacaccgcc ttagctacaa gttgccaacc aagcgtcaga aattgggtgt 29100
catggtggga gaaaagccca ttaccataac tcagcactcg gtgaaaccg aaggctgcat 29160
tcactcacct tgtcaaggac ctgaggatct ctgcaccctt attaagacc tgtgcggtct 29220
caaagatctt attcccttta actaataaaa aaaaataata aagcatcact tacttaaaat 29280
cagtttagcaa atttctgtcc agtttattca gcagcacctc cttgccctcc tcccagctct 29340
ggttattgag cttcctcctg gctgcaaaact ttctccacaa tctaaatgga atgtcagttt 29400
cctcctgttc ctgtccatcc gcacccacta tcttcatgtt gttgcagatg aagcgcgcaa 29460
gaccgtctga agataccttc aaccccgtgt atccatatga cacggaaacc ggtcctccaa 29520
ctgtgccttt tcttactctc ccttttgtat cccccaatgg gtttcaagag agtccccctg 29580
gggtactctc tttgcgcta tccgaacctc tagttacctc caatggcatg cttgcgctca 29640
aaatgggcaa cggcctctct ctggacgagg ccggcaacct tactcccaa aatgtaacca 29700
ctgtgagccc acctctcaaa aaaaccaagt caaacataaa cctggaaata tctgcacccc 29760
tcacagttac ctcaagaagc ctaactgttg ctgcccgcgc acctctaag gtccgggcca 29820
acacactcac catgcaatca caggccccgc taaccgtgca cgactccaaa cttagcattg 29880
ccacccaagg acccctcaca gtgtcagaag gaaagctagc cctgcaaaaa tcaggcccc 29940
tcaccaccac cgatagcagt acccttacta tcaactgcctc accccctcta actactgcca 30000
ctggtagctt gggcattgac ttgaaagagc ccatttatca acaaaatgga aaactaggac 30060
taaaagtacgg ggctcctttg catgtaacag acgacctaaa cactttgacc gtatgcaactg 30120
gtccagggtg gactattaat aatacttctt tgcaaaactaa agttactgga gccttgggtt 30180
ttgatccaca aggcaatatg caacttaatg tagcaggagg actaaggatt gattctcaaa 30240
acagacgcct tatacttgat gttagttatc cgtttgatgc tcaaaaccaa ctaaatctaa 30300
gactaggaca gggccctctt ttataaaact cagcccacaa cttggatatt aactacaaca 30360
aaggccttta cttgtttaca gttcacaaca attccaaaaa gcttgagggtt aacctaagca 30420
ctgccaaggg gttgatgttt gacgctacag ccatagccat taatgcagga gatgggcttg 30480
aatttggttc acctaatgca ccaaacacaa atccccctca acaaaaaatt ggccatggcc 30540
tagaatttga ttcaaacaaag gctatggttc ctaaaactagg aactggcctt agttttgaca 30600
gcacaggtgc cattacagta ggaacaaaaa ataagataa gctaactttg tggaccacac 30660
cagctccatc tcctaactgt agactaaatg cagagaaaga tgctaaactc actttggtct 30720
taacaaaatg tggcagtcac atacttgcta cagtttcagt tttggtgtt aaaggcagtt 30780
tggctccaat atctggaaca gttcaaagtg ctcatcttat tataagattt gacgaaaatg 30840
gagtgctact aaacaattcc ttcttgacc cagaatattg gaactttaga aatggagatc 30900
ttactgaagg cacagcctat acaaacgctg ttggatttat gcctaaccta tcagcttatc 30960
caaaatctca cggtaaaact gccaaaagta acattgtcag tcaagtttac ttaaacggag 31020
acaaaactaa acctgtaaca ctaaccatta cactaaacgg tacacaggaa acaggagaca 31080
caactccaag tgcatactct atgtcatttt catgggactg gtctggccac aactacatta 31140
atgaaatatt tgccacatcc tcttacactt tttcatacat tgcccaagaa taaagaatcg 31200
tttgtgttat gtttcaacgt gtttattttt caattgcaga aaatttcaag tcatttttca 31260
ttcagtagta tagccccacc accacatagc ttatacagat caccgtacct taatcaaact 31320
cacagaaccc tagtattcaa cctgccacct cctcccaac acacagagta cacagtcctt 31380
tctccccggc tggccttaaa aagcatcata tcatgggtaa ctaggtgtt 31440
atattccaca cggtttctg tcgagccaaa cgctcatcag tgatattaat aaactccccg 31500

```

```

ggcagctcac ttaagttcat gtcgctgtcc agctgtctgag ccacaggctg ctgtccaact 31560
tgcggttgct taacggggcg cgaaggagaa gtccacgcct acatgggggt agagtcataa 31620
tcgtgcatca ggataggcg gtggtgctgc agcagcgcg gaataaactg ctgccgccc 31680
cgctccgtcc tgcaggaata caacatggca gtggtctcct cagcgatgat tcgcaccgcc 31740
cgcagcataa ggcgccctgt cctccgggca cagcagcgca ccctgatctc acttaaatca 31800
gcacagtaac tgcagcacag caccacaata ttgttcaaaa tcccacagtg caaggcgctg 31860
tatccaaagc tcatggcggg gaccacagaa cccacgtggc catcatacca caagcgagg 31920
tagattaagt ggcgaccct cataacaacg ctggacataa acattacctc ttttggcatg 31980
ttgtaattca ccacctccg gtacatata aacctctgat taaacatggc gccatccacc 32040
accatcctaa accagctggc caaaacctgc ccgcccgtc tacactgcag ggaaccggga 32100
ctggaacaat gacagtggag agcccaggac tcgtaacct ggatcatcat gctcgtcatg 32160
atatcaatgt tggcacaca caggcacacg tgcatacact tctcaggat tacaagctcc 32220
tcccgcgtta gaaccatata ccagggaaca acccattcct gaatcagcgt aaatcccaca 32280
ctgcagggaa gacctcgcac gtaactcacg ttgtgcattg tcaaagtgtt acattcgggc 32340
agcagcggat gatcctccag tatggtagcg cgggtttctg tctcaaaagg aggtagacca 32400
tccctactgt acggagtgcg ccgagacaac cgagatcgtg ttggtcgtag tgcattgcca 32460
aatggaacgc cgacgtagt catatttcct gaagcaaaac cagggtgcggg cgtgacaaac 32520
agatctgcgt ctccggtctc gccgcttaga tcgctctgtg tagtagtgt agtatatcca 32580
ctctctcaaa gcatccaggc gccccctggc ttccgggtct atgtaaactc cttcatgcgc 32640
cgctgcctg ataacatcca ccaccgcaga ataagccaca cccagccaac ctacacattc 32700
gttctgcgag tcacacacgg gaggagcggg aagagctgga agaaccatgt tttttttttt 32760
attccaaaag attatccaaa acctcaaaat gaagatctat taagtgaacg cgtccccctc 32820
cgggtggcgtg gtcaaaactct acagccaaag aacagataat ggcattttgt agatgttgca 32880
caatggcttc caaaaggcaa acggccctca cgtccaagt gacgtaaagg ctaaaccctt 32940
cagggtagaatt ctcctctata aacattccag cactttcaac catgccccaa taattctcat 33000
ctcgccacct tctcaatata tctctaagca aatcccgaat attaatgctg gccattgtaa 33060
aaatctgctc cagagcgccc tcacacctca gcctcaagca gcgaatcatg attgcaaaaa 33120
ttcaggttcc tcacagacct gtataagatt caaaagcgga acatttaaca aaataccgcg 33180
atcccgtagg tcccttcgca gggccagctg aacataatcg tgcaggtctg cacggaccag 33240
cgcgccact tcccgcgag gaaccttgac aaaagaaccc aactgatta tgacacgcag 33300
actcggagct atgctaacca gcgtagcccc gatgtaagct ttgttgcatg ggcggcgata 33360
taaaatgcaa ggtgctgctc aaaaaatcag gcaaaagcct gcgcaaaaaa gaaagcacat 33420
cgtagtcatg ctcatgcaga taaaggcagg taagctccgg aaccaccaca gaaaaagaca 33480
ccatttttct ctcaaacatg tctgcgggtt tctgcataaa cacaaaaata aataacaaaa 33540
aaacatttaa acattagaag cctgtcttac aacaggaaaa acaaccctta taagcataag 33600
acggactacg gccatgccgg cgtgaccgta aaaaaactgg tcaccgtgat taaaaagcac 33660
caccgacagc tcctcgggta tgcgggagc cataatgtaa gactcggtaa acacatcagg 33720
ttgattcatc ggtcagtgct aaaaagcgac cgaatatagc cgggggaata catacccgca 33780
ggcgtagaga caacattaca gcccccatag gaggtataac aaaattaata ggagagaaaa 33840
acacataaac acctgaaaaa cctcctgcc taggcaaaat agcaccctcc cgtccagaa 33900
caacatacag cgcttcacag cggcagccta acagtcagcc ttaccagtaa aaaaagaaaac 33960
ctattaaaaa aacaccactc gacacggcac cagctcaatc agtcacagt taaaaaagg 34020
ccaagtgcgt tacactgcag cagggtgtgac tcagccatgg cactctgca gcctgggtac 34080
cctgcttggg gcatggcccc ttatagctgg gcggggcgtg ggggctctgt aggagtggca 34140
gcgacctcag tgtttgtctt tgctctgaag agccctccag gtgcttgatc ccaccttttc 34200
ccagcaggaa cactcctgcc tgccctacca cctgtcctgg ctgatggcct gttcctgcc 34260
cctttgcccc ctgcccagac tcccattgtt ctggacttgt ggcttctcc aaccaggggc 34320
tctcaagcct ccatacctgg tcccacctct ccaggccgtg ggaggagggt tgaggagggt 34380
ggagggcata tggttggggg cagcctgggt gttcccctcc catcccctcc ctgggcctcc 34440
caggccccct ctactcttga gcaatgctct tgagagcttc ctgcctggct cttaaaccag 34500
ggcaagccct ggaaggcgag acccaggaca ctctcaccac ctcttaacct tttcccctgg 34560
aaaaatcttc tgtatacttc ccattttaag aaaactacaa tcccaaacac atacaagtta 34620
ctccgcccta aaacctacgt caccgcccc gttcccacgc cccgcgccac gtcacaaact 34680
ccacccccctc attatcatat tggcttcaat ccaaaataag gtatattatt gatgatg 34737

```

<210> 16

<211> 36114

<212> DNA

<213> Adenovirus subgroup C

<400> 16

```

catcatcaat aatatacctt attttgatt gaagccaata tgataatgag ggggtggagt 60
ttgtgacgtg gcgcgggcg tgggaacggg gcgggtgacg tagtagtgtg gcggaagtgt 120
gatgttgcaa gtgtggcgga acacatgtaa gcgacggatg tggcaaaagt gacgtttttg 180
gtgtgcgccc gtgtacacag gaagtgacaa ttttcgcgcg gttttaggcg gatgtttagt 240
taaatattggg cgtaaccgag taagatttgg ccattttcgc gggaaaactg aataagagga 300

```

```

agtgaatctt gaataatttt gtgttactca tagcgcgtaa tattttgtcta gggccgcggg 360
gactttgacc gtttacgtgg agactcgccc aggtgttttt ctcaggtgtt ttccgcgttc 420
cgggtcaaaag ttggcgtttt attattatag tcagctgacg tgtagtgtat ttatacccg 480
tgagttcctc aagaggccac tcttgagtgc cagcagtag agttttctcc tccgagccgc 540
tccgacaccg ggaactgaaa tgagacatga ggtactggct gataatcttc cacctcctag 600
ccattttgaa ccacctaccc ttcacgaact gtatgattta gacgtgacgg cccccgaaga 660
tcccaacgag gaggcgtttt cgagattttt tcccgaactc gtaatgttgg cgggtgcagga 720
agggattgac ttactcactt tccgcgcggc gcccggttct ccggagccgc ctcacctttc 780
ccggcagccc gagcagccgg agcagagagc cttgggtccg gtttgccacg aggctggcct 840
tccaccaggt gacgacgagg atgaagaggg tgaggagttt gtgttagatt atgtggagca 900
ccccgggacg ggttgcaggt cttgtcatta tcaccggagg aatacggggg acccagatat 960
tatgtgttcg ctttgctata tgaggacctg tggcatgttt gtctacagta agtgaaaatt 1020
atgggcagtg ggtgatagag tgggtgggtt ggtgtggtta tttttttttt aattttttaca 1080
gtttttgtgt ttaaagaatt ttgtattgtg atttttttaa aaggctcctgt gtctgaacct 1140
gagcctgagc ccgagccaga accggagcct gcaagacctt cccgcgctcc taaaatggcg 1200
cctgtctatc tgagacgccc gacatcacct gtgtctagag aatgcaatag tagtacggat 1260
agctgtgact ccggctcctc taacacacct cctgagatac acccggttgt cccgctgtgc 1320
cccatataac cagttgccgt gagagtgtgt gggcgtcgcc aggctgtgga atgtatcgag 1380
gacttgctta acgagcctgg gcaacctttg gacttgagct gtaaacgccc caggccataa 1440
ggtgtaaacc tgtgattgcg tgtgtgggta acgcctttgt ttgctgaatg agttgatgta 1500
agtttaataa agggtgagat aatgtttaac ttgcatggcg tgttaaatgg ggcggggcct 1560
aaagggtata taatgcgcgg tgggctaata ttggttacat ctgacctcat ggaggccttg 1620
gagtgtttgg aagatttttc tgcgtgctgt aacttgcctg aacagagctc taacagtacc 1680
tcttggtttt ggagggttct gtggggctca tcccaggcaa agttagtctg cagaattaa 1740
gaggattaca agtgggaatt tgaaagctt ttgaaatcct gtgggtgagct gtttgattct 1800
ttgaatctgg gtcaccaggc gcttttccaa gagaaggtca tcaagacttt ggatttttcc 1860
acaccggggc gcgctgcggc tgcgtgttct tttttgagtt ttataaagga taaatggagc 1920
gaagaaaccc atctgagcgg ggggtacctg ctggattttc tggccatgca tctgtggaga 1980
gcggttgtga gacacaagaa tcgcctgcta ctgtgtctt ccgtccgccc ggcgataata 2040
ccgacggagg agcagcagca gcagcaggag gaagccaggc ggcggcggca ggagcagagc 2100
ccatggaacc cgagagccgg cctggaccct cgggaatgaa tgtgtacag gtgctgaac 2160
tgtatccaga actgagacgc attttgacaa ttacagagga tgggcagggg ctaagggggg 2220
taaagaggga gcggggggct tgtgaggcta cagaggaggc taggaatcta gcttttagct 2280
taatgaccag acaccgtcct gagtgtatta cttttcaaca gatcaaggat aattgcgcta 2340
atgagcttga tctgctggcg cagaagtatt ccatagagca gctgaccact tactggctgc 2400
agccaggggg tgattttgag gaggctatta ggttatatgc aaagggtggc cttaggccag 2460
attgcaagta caagatcagc aaacttgtaa atatcaggaa ttgttgctac atttctggga 2520
acggggcgca ggtggagata gatacggagg atagggtggc ctttagatgt agcatgataa 2580
atatgtggcc gggggtgctt ggcatggacg ggggtggtat tatgaatgta aggtttactg 2640
gccccaattd tagcggtagc gttttcctgg ccaataccaa ccttatccta cacggtgtaa 2700
gcttctatgg gtttaacaat acctgtgtgg aagcctggac cgatgtaagg gttcggggct 2760
gtgcctttta ctgctgctgg aaggggggtg tgtgtcgccc caaaagcagg gcttcaatta 2820
agaaatgcct ctttgaaagg tttaccttgg gtatcctgtc tgagggtaac tccaggggtg 2880
gccacaatgt ggctccgac tgtggttgc tcatgctagt gaaaagcgtg gctgtgatta 2940
agcataacat ggtatgtggc aactgcgagg acagggcctc tcagatgctg acctgctcgg 3000
acggcaactg tcacctgctg aagaccatc acgtagccag ccactctcgc aaggcctgcg 3060
cagtgtttga gcataacata ctgaccgcgt gttccttgca tttgggtaac aggagggggg 3120
tgttctacc ttaccaatgc aatttgagtc acactaagat attgcttgag cccgagagca 3180
tgtccaaggt gaacctgaac ggggtgtttg acatgaccat gaagatctgg aaggtgtctg 3240
ggtacgatga gacccgcacc aggtgcagac cctgcgagtg tggcggtaaa catattgga 3300
accagcctgt gatgctggat gtgaccgagg agctgaggcc cgatcacttg gtgctggcct 3360
gcacccgcgc tgagtttggc tctagcgtg aagatacaga ttgaggtact gaaatgtgtg 3420
ggcgtggctt aagggtggga aagaatatat aagggtgggg tcttatgtag tttgttatct 3480
gttttgacg agccgcccgc gccatgagca ccaactcgtt tgatggaagc attgtgagct 3540
catatttgac aacgcgcagc cccccatgg cgggggtgcg tcagaatgtg atgggctcca 3600
gcattgatgg tcgccccgtc ctgcccgcga actctactac cttgacctac gagaccgtgt 3660
ctggaacgcc gttggagact gcagcctccg ccgcccgttc agccgctgca gccaccgccc 3720
gcgggattgt gactgacttt gctttcctga gcccgcttgc aagcagtgca gcttcccgtt 3780
catccgcccg cgatgacaag ttgacggctc ttttggcaca attggattct ttgaccggg 3840
aaacttaatt cgtttctcag cagctgttgg atctgcgcca gcagggttct gccctgaagg 3900
cttctcccc tcccaatgcg gtttaaaaca taaataaaaa accagactct gtttggattt 3960
ggatcaagca agtgtcttgc tgtctttatt taggggtttt gcgcgcgcgg taggccggg 4020
accagcgtgc tcggtcgttg aggtcctgt gtatttttcc caggacgtgg taaaggtgac 4080
tctggatgtt cagatacatg ggcataagcc cgtctctggg gtggaggtag caccactgca 4140
gagcttcatg ctgccccgtg gtgtttaga tgatccagtc gtagcaggag cgctggcggt 4200
ggtgcctaaa aatgtctttc agtagcaagc tgattgccag gggcaggccc ttggtgtaa 4260

```


tgtttacaaa	gcggttaagc	tgggatgggt	gcatacgtgg	ggatatgaga	tgcaccttgg	4320
actgtatttt	taggttggct	atgttcccag	ccatatccct	ccggggattc	atgttgtgca	4380
gaaccaccag	cacagtgtat	ccggtgcact	tgggaaattt	gtcatgtagc	ttagaaggaa	4440
atgcgtggaa	gaacttggag	acgcccttgt	gacctccaag	attttccatg	cattcgtcca	4500
taatgatggc	aatgggcca	cgggcggcgg	cctgggcgaa	gatatttctg	ggatcactaa	4560
cgtcatagtt	gtgttccagg	atgagatcgt	cataggccat	ttttacaaag	cgcgggcgga	4620
gggtgccaga	ctgcggtata	atggttccat	ccggcccagg	ggcgtagtta	ccctcacaga	4680
tttgcatttc	ccacgctttg	agttcagatg	gggggatcat	gtctacctgc	ggggcgatga	4740
agaaaacggt	ttccggggta	ggggagatca	gctgggaaga	aagcaggttc	ctgagcagct	4800
gcgacttacc	gcagccggtg	ggcccgtaaa	tcacacctat	taccgggtgc	aactggtagt	4860
taagagagct	gcagctgcgc	tcatccctga	gcaggggggc	cacttcgtta	agcatgtccc	4920
tgactcgcat	gttttccctg	accaaaccg	ccagaaggcg	ctgcgcgcc	agcgatagca	4980
gttcttgc aa	ggaagcaaag	tttttcaacg	gtttgagacc	gtccgccgta	ggcatgcttt	5040
tgagcgtttg	accaagcagt	tccaggcggg	cccacagctc	ggtcacctgc	tctacggcat	5100
ctcgatccag	catatctcct	cgtttccgcg	gttggggcgg	ctttcgtctg	acggcagtag	5160
tcggtgctcg	tccagacggg	ccagggtcat	gtctttccac	gggcgcaggg	tcctcgtcag	5220
cgtagtctgg	gtcacggtga	aggggtgcgc	tccgggctgc	gcgctggcca	gggtgcgctt	5280
gaggctggct	ctgctggtgc	tgaagcgctg	ccggtcttcg	ccctgcgctg	cggccaggta	5340
gcatcttgacc	atggtgtcat	agtcacagcc	ctccgcggcg	tggcccttgg	cgcgcagctt	5400
gcccttggag	gaggcgccgc	acgaggggca	gtgcagactt	ttgaggcgct	agagcttggg	5460
cgcgagaaat	accgattccg	gggagtaggc	atccgcgcgc	caggccccgc	agacggtctc	5520
gcattccacg	agccagggtga	gctctggccg	ttcgggggtca	aaaaccagggt	ttcccccatg	5580
ctttttgatg	cgtttcttacc	ctctggttcc	catgagccgg	tgtccacgct	cgggtgacgaa	5640
aaggctgtcc	gtgtcccgct	atacagactt	gagaggcctg	tcctcgagcg	gtgttccgcg	5700
gtcctcctcg	tatagaaact	cggaccactc	tgagacaaag	gctcgcgtcc	aggccagcac	5760
gaaggaggct	aagtgggagg	ggtagcggtc	gttgctcact	agggggtcca	ctcgcctccag	5820
ggtgtgaaga	cacatgtcgc	cctcttcggc	atcaaggaaag	gtgattggtt	tgtaggtgta	5880
ggccacgtga	ccgggtgttc	ctgaaggggg	gctataaaag	gggggtgggg	cgcgttcgctc	5940
ctcactctct	tccgcacgcg	tgtctgcgag	ggccagctgt	tggggtgagt	actccctctg	6000
aaaagcgggc	atgacttctg	cgctaagatt	gtcagtttcc	aaaaacgagg	aggatttgat	6060
attcacctgg	cccgcggtga	tgccttttag	ggtggccgca	tccatctggt	cagaaaagac	6120
aatctttttg	ttgtcaagct	tgttggaaca	cgacccttag	agggcggttg	acagcaactt	6180
ggcgatggag	cgcagggttt	ggtttttgtc	gcgacggcg	cgctccttgg	ccgcgatgtt	6240
tagctgcacg	tattcgcgcg	caacgcaccg	ccattcggga	aagacggtgg	tgcgctcgtc	6300
gggcaccagg	tgcacgcgcc	aaccgcggtt	gtgcagggtg	acaagggtcaa	cgctggtggc	6360
tacctctcgg	cgtaggcgct	cgttggtcca	gcagaggcgg	ccgcccttgc	gcgagcagaa	6420
tggcggttag	gggtctagct	cgctctcgtc	cggggggtct	gcgtccacgg	taaagacccc	6480
gggcagcagg	cgcgcgtcga	agtagtctat	cttgcatcct	tgcaagtcta	gcgcctgctg	6540
ccatgcgcgg	gcggcaagcg	cgcgctcgta	tgggttgagt	gggggacccc	atggcatggg	6600
gtgggtgagc	gcggaggcgt	acatgccgca	aatgtcgtaa	acgtagaggg	gctctcttag	6660
tattccaaga	tatgtagggt	agcatcttcc	accgcggatg	ctggcgcgca	cgtaactcgt	6720
tagttcgtgc	gagggagcga	ggaggtcggg	accgaggttg	ctacgggcgg	gctgctctgc	6780
tcggaagact	atctgcctga	agatggcatg	tgagttggat	gatattggtt	gacgctggaa	6840
gacgttgaag	ctggcgctctg	tgagacctac	cgcgtcacgc	acgaaggagg	cgtaggagtc	6900
gcgagcttgg	ttgaccagct	cggcggtgac	ctgcacgtct	agggcgagct	agtcacgggt	6960
ttccttgatg	atgtcatact	tatcctgttc	cttttttttc	cacagctcgc	ggttgaggac	7020
aaactcttcc	cggctcttcc	agtactcttg	gatcgaaac	ccgtcggcct	ccgaacggta	7080
agagcctagc	atgtagaact	ggttgacggc	ctggtagggc	cagcatccct	tttctacggg	7140
tagcgcgtat	gcctgcgcgg	ccttccggag	cgaggtgtgg	gtgagcgcaa	aggtgtccct	7200
gacctgact	ttgaggtact	ggtatttgaa	gtcagtgctg	tcgcatccgc	cctgtctcca	7260
gagcaaaaag	tccgtgcgct	ttttggaacg	cggatttggc	agggcgaaag	tgacatcgct	7320
gaagagtatc	tttcccgccg	gaggcataaa	gttgcggtg	atgcggaagg	gtcccggcac	7380
ctcggaaacg	ttgttaatta	cctggggcgc	gagcacgatc	tcgtcaaagc	cgttgatgtt	7440
gtggcccaaca	atgtaaagtt	ccaagaagcg	cgggatgccc	ttgatggaag	gcaatttttt	7500
aagttcctcg	taggtgagct	cttcagggga	gctgagcccc	tgctctgaaa	gggcccagtc	7560
tgcaagatga	gggttggaag	cgacgaatga	gctccacagg	tcacgggcca	ttagcatttg	7620
caggtggctg	cgaagggtcc	taaactggcg	acctatggcc	attttttctg	gggtgatgca	7680
gtagaaggta	agcgggtctt	gttcccagcg	gtcccatcca	aggttcgcgg	ctaggtctcg	7740
cgcggcagtc	actagaggct	catctccgcc	gaacttcagt	accagcatga	agggcacgag	7800
ctgcttccca	aaggccccc	tccaagtata	ggtctctaca	tcgtagggtga	caaagagacg	7860
ctcgggtcga	ggatgcgagc	cgatcgggaa	gaactggatc	tcccgcacac	aattggagga	7920
gtggctattg	atgtgggtgaa	agtagaagtc	cctgcgacgg	gccgaacact	cgtgctgggt	7980
tttgtaaaaa	cgtgcgcagt	actggcagcg	gtgcacgggc	tgtacatcct	gcacgaggtt	8040
gacctgacga	ccgcgcacaa	ggaagcagag	tgggaatttg	agccctcgc	ctggcgggtt	8100
tggctggtgg	tcttctactt	cggctgcttg	tccttgaccg	tctggtgct	cgaggggagt	8160
tacggtggat	cggaccacca	cgcgcgcgca	gccc aaagtc	cagatgtccg	cgcgcggcgg	8220

tcggagcttg atgacaacat cgcgcagatg ggagctgtcc atggctctgga gctcccgcgg 8280
 cgtcaggtca ggccggagct cctgcaggtt tacctcgcag agacgggtca gggcgccggc 8340
 tagatccagg tgatacctaa tttccagggg ctggttggtg gcggcgctga tggcttgcaa 8400
 gagggcgcat ccccgccggc cgactacggt accgcgcggc gggcggtggg ccgcgggggt 8460
 gtccttggat gatcatctta aaagcggtag cgcgggagag ccccgaggag tagggggggc 8520
 tccggaccgg ccgggagagg gggcaggggc acgtcggcgc cgcgcgcggg caggagctgg 8580
 tgctgcgcgc gtagggttct ggcgaacgcg acgacgcggc ggttgatctc ctgaatctgg 8640
 cgcctctgcg tgaagacgac gggcccgggt agcttgagcc tgaagagag ttcgacagaa 8700
 tcaatttcgg tgcgttgac ggcggcctgg cgaaaaatct cctgcacgtc tctgagttg 8760
 tcttgatagg cgatctcggc catgaactgc tcgatctctt cctcctggag atctccgcgt 8820
 ccggctcgtc ccacggtggc ggcgaggtcg ttgaaaatgc gggccatgag ctgcgagaa 8880
 gcgttgaggc ctccctcgtt ccagacgcgg ctgtagacca cggcccttc ggcatcgcgg 8940
 gcgcgcata ccacctgcgc gagattgagc tccacgtgcc gggcgaaagac ggcgtagttt 9000
 cgcaggcgct gaaagaggta gttgaggtg gtggcggtgt gttctgccac gaagaagtac 9060
 ataaccagc gtcgaacgt ggattcgtt atatcccca aggcctcaag gcgctccatg 9120
 gcctcgtaga agtccacggc gaagttaa aactgggagt tgcgcgcga cagggttaac 9180
 tcctcctcca gaagacggat gagctcggcg acagtgtcgc gcacctcgcg tcaaaaggc 9240
 acaggggccc ctctctctt ttcaatctcc tctccataa gggcctcccc ttctctctt 9300
 tctggcgcg gtgggggagg ggggacacgg cggcgacgac ggcgcaccgg gaggcggtcg 9360
 acaaagcgct cgatcatctc cccgcgcgca cggcgcatgg tctcggtagc ggcgcgcggc 9420
 ttctcgcggg ggcgcagttg gaagacggcg cccgtcatgt cccgggtatg ggtggcggg 9480
 gggctgccat cgcgcaggga tacggcgcta acgatgcata tcaacaattg ttgtgtaggt 9540
 actccgcgcg cgagggacct gagcgagtc gcacgcacc gatcggaata cctctcgaga 9600
 aaggcgctta accagtcaca gtcgcaaggt aggtgagca ccgtggcggg cggcagcggg 9660
 cggcggtcgg ggttgtttct ggcggaggtg ctgctgatga tgaattaaa gtaggcggtc 9720
 ttgagacggc ggatggtcga cagaagcacc atgtccttgg gtcggcgctg ctgaatgcgc 9780
 aggcggtcgg ccagtcacca ggcttctgtt tgacatcggc gcaggtcttt gtagtagtct 9840
 tgcatgagcc ttcttaccgg cacttcttct tctccttct ctgtcctgc atctcttgca 9900
 tctatcgctg cgcgcgcggc ggagtttggc cgtaggtggc gccctcttcc tcccatgcgt 9960
 gtgaccccca agccccctat cggctgaagc agggctaggt cggcgacaac gcgctcggct 10020
 aatatggcct gctgcacctg cgtgaggtga gactggaagt catccatgtc cacaagcgg 10080
 tggatgcgc ccgtgttgat ggtgtaagt cagttggcca taacggacca gttaacggtc 10140
 tggtagcccg gctgcgagag ctcggtgtac ctgagacgcg agtaagccct cgagtcfaat 10200
 acgtagtcgt tgcaagtccg caccaggtac ttgtatccca ccaaaaagtg cggcgccggc 10260
 tggcggtaga ggggccagcg taggttggcc ggggctccgg gggcgagatc ttccaacata 10320
 aggcgatgat atccgtagat gtacctggac atccaggtga tgccggcggc ggtggtggag 10380
 gcgcgcggaa agtcgcggac gcggttccag atgttgccga gcggcaaaa gtgctccatg 10440
 gtcgggacgc tctggccggt caggcgcgcg caatcgttga cgctctagcg tgcaaaagga 10500
 gagcctgtaa cggggcactc ttccgttggc ttgtggataa attcgcaagg gtatcatggt 10560
 ggacgaccgg ggttcgagcc ccgtatccgg ccgtccggcg tgatccatgc ggttaccgcc 10620
 cgcgtgtcga acccaggtgt gcgacgtcag acaacgggg agtgctcctt ttggcttctc 10680
 tccagcgcg cgcggtctg cgtagcttt tttggccact ggcgcgcgc agcgtaagcg 10740
 gttaggtcgg aaagcgaaag cattaagtgg ctgcctccct tagccggag ggtattttc 10800
 caagggttga gtcgcgggac ccccggtcgc agtctcggac cggccggact ggcgcgaacg 10860
 ggggtttgcc tccccgtcat gcaagacccc gcttgcaaat tctccggaa acagggacga 10920
 gcccttttt tgcttttccc agatgcattc ggtgctgcgg cagatgcgcc cccctcctca 10980
 gcagcgcaa gagcaagagc agcggcagac atgcagggca cctcccctc ctctaccgc 11040
 gtcaggagg gcgacatccg cggttgacgc ggcagcagat ggtgattacg aaccctccgc 11100
 gcgcggggcc cggcactacc tggacttggg ggagggcgag ggcctggcg ggctaggagc 11160
 gccctctcct gagcgtacc caagggtgca gctgaagcgt gatacgctg agcggtacgt 11220
 gccgcggcag aacctgttt gcgaccgca gggagaggag cccgaggaga tgcgggatcg 11280
 aaagtccac gcagggcgcg agctgcggca tggcctgaat cgcgagcgtg tgctgcgca 11340
 ggaggacttt gagcccgacg cgcgaaccgg gattagtccc gcgcgcgcac acgtggcggc 11400
 cgccgacctg gtaaccgat acgagcagac ggtgaaccag gagattaact ttcaaaaaa 11460
 cttaacaac cacgtgcgta cgcttggggc gcgcgagag gttgctatag gactgatgca 11520
 tctgtgggac ttgttaagcg cgctggagca aaacccaaat agcaagccgc tcatggcgca 11580
 gctgttctct atagtgcagc acagcaggga caacgaggca ttcagggatg cgctgctaaa 11640
 catagtagag cccgagggcc gctggctgct cgatttgata aacatcctgc agagcatagt 11700
 ggtgcaggag gcgagcttga gcctggtgca caagggtggc gccatcaact attcatgct 11760
 tagcctgggc aagttttacg cccgcaagat ataccatacc ccttacgttc ccatagacaa 11820
 ggaggtaaag atcgaggggt tctacatgcg catggcgctg aaggtgctta ccttgagcga 11880
 cgacctgggc gtttatcgca acgagcgcat ccacaaggcc gtgagcgtga gccggcgcg 11940
 cgagctcagc gaccgcgagc tgatgcacag cctgcaaaag gccctggctg gcacggcgag 12000
 cggcgataga gaggccgagt cctactttga cgcggcgctg gacctgcgct gggccccaag 12060
 ccgacgcgcg ctggaggcag ctggggccgg acctgggctg gcggtggcac ccgcgcgcg 12120
 tggcaacgct ggcggcggtg aggaatatga cgaggacgat gagtacgagc cagaggacgg 12180

cgagtactaa	gcggtgatgt	ttctgatcag	atgatgcaag	acgcaacgga	cccggcggtg	12240
cgggcgggcg	tgcagagcca	gccgtccggc	cttaactcca	cggacgactg	gcgccaggtc	12300
atggaccgca	tcatgtcgct	gactgcgcgc	aatcctgacg	cgttccggca	gcagccgcag	12360
gccaaccggc	tctccgcaat	tctggaagcg	gtggtcccg	cgcgcgcaaa	ccccacgcac	12420
gagaaggtgc	tggcgatcgt	aaacgcgctg	gccgaaaaca	gggccatccg	gcccgcagag	12480
gccggcctgg	tctacgacgc	gctgtctcag	cgcgtggctc	gttacaacag	cggcaacgtg	12540
cagaccaaac	tggaccggct	ggtgggggat	gtgcgcgagg	ccgtggcgca	gcgtgagcgc	12600
gcgcagcagc	agggcaacct	gggtccatg	gttgactacta	acgccttcct	gagtacacag	12660
cccgcgaacg	tgcgcggggg	acaggaggac	tacaccaact	ttgtgagcgc	actgcggtta	12720
atggtgactg	agacaccgca	aagtgaggtg	taccagtctg	ggccagacta	tttttccag	12780
accagtagac	aaggcctgca	gaccgtaaac	ctgagccagg	ctttcaaaaa	cttgacgggg	12840
ctgtgggggg	tgcgggctcc	cacaggcgac	cgcgcgaccg	tgtctagctt	gctgacgccc	12900
aactcgcgcc	tgttgctgct	gctaatacgc	cccttcacgg	acagtggcag	cgtgtcccgg	12960
gacacatacc	taggtcactt	gctgacactg	taccgcgagg	ccataggtca	ggcgcagtgt	13020
gacgagcata	ctttccagga	gattacaagt	gtcagccggc	cgctggggca	ggaggacacg	13080
ggcagcctgg	aggcaaccct	aaactacctg	ctgaccaacc	ggcggcagaa	gatccccctc	13140
ttgcacagtt	taaacagcga	ggaggagcgc	attttgcgct	acgtgcagca	gagcgtgagc	13200
cttaacctga	tgcgcgacgg	ggtaacgccc	agcgtggcgc	tggacatgac	cgcgcgcaac	13260
atggaaccgg	gcatgtatgc	ctcaaaccgg	ccgtttatca	accgcctaata	ggactacttg	13320
catcgcgcgg	ccgcgctgaa	ccccgagtat	ttcaccaatg	ccatcttgaa	cccgactgtg	13380
ctaccgcccc	ctggtttcta	caccggggga	ttcgaggtgc	ccgagggtaa	cgatggattc	13440
ctctgggacg	acatagacga	cagcgtgttt	tccccgcaac	cgagaccctt	gctagagtgt	13500
caacagcgcg	agcaggcaga	ggcggcgctg	cgaagggaaa	gcttccgcag	gccaagcagc	13560
ttgtccgatc	taggcgctgc	ggccccgcgg	tcagatgcta	gtagccattt	tccaagcttg	13620
ataggtctct	ttaccagcac	tcgcaccacc	cgccccgcgc	tgttggcgca	ggaggagtac	13680
ctaaacaact	cgctgctgca	gccgcagcgc	gaaaaaaacc	tgcctccggc	atttcccaac	13740
aacgggatag	agagcctagt	ggacaagatg	agtagatgga	agacgtacgc	gcaggagcac	13800
agggacgtgc	caggccccgc	cccgccacc	cgctgtcaaa	ggcacgaccg	tcagcggggt	13860
ctgggtgtgg	aggacgatga	ctcggcagac	gacagcagcg	tcctggattt	gggaggaggt	13920
ggcaaccctg	ttgcgcacct	tcgccccagg	ctggggagaa	tgttttataa	aaaaaaaagc	13980
atgatgcaaa	ataaaaaact	caccaaggcc	atggcaccga	gcgttggttt	tcttgtattc	14040
cccttagtat	gcggcgcgcg	gcgatgtatg	aggaaggtcc	tcctccctcc	tacgagagtg	14100
tggtagcgcg	ggcgccagtg	gcggcgcgcg	tgggttctcc	cttcgatgct	ccccgtgacc	14160
cgccgtttgt	gcctccgcgg	tacctgcggc	ctaccggggg	gagaaacagc	atccgttact	14220
ctgagttggc	acccctattc	gacaccacc	gtgtgtacct	ggtggacaac	aagtcaacgg	14280
atgtggcatc	cctgaactac	cagaacgacc	acagcaactt	tctgaccacg	gtcattcaaa	14340
acaatgacta	cagcccgggg	gaggcaagca	cacagaccat	caatcttgac	gaccggtcgc	14400
actggggcgg	cgacctgaaa	accatcctgc	ataccaacat	gccaaatgtg	aacgagttca	14460
tgtttaccaa	taagtttaag	gcgcggtgta	tgggtgtcgc	cttgcttact	aaggacaatc	14520
aggttgagct	gaaatacgag	tgggtggagt	tcacgctgcc	cgagggcaac	tactccgaga	14580
ccatgaccat	agaccttatg	aacaacgcga	tcgtggagca	ctacttgaaa	gtgggcagac	14640
agaacggggt	tctggaagcg	gacatcgggg	taaagtgtga	caccgcgaac	ttcagactgg	14700
ggtttgaccc	cgctactggt	cttgtcatgc	ctggggtata	tacaaacgaa	gccttccatc	14760
cagacatcat	tttgctgccca	ggatgcgggg	tggacttcac	ccacagccgc	ctgagcaact	14820
tgttgggcat	ccgcaagcgg	caacccttcc	aggaggcctt	taggatcacc	tacgatgatc	14880
tggaggggtg	taacattccc	gcactgttgg	atgtggacgc	ctaccaggcg	agcttgaaag	14940
atgacaccga	acagggcggg	ggtggcgcag	gcggcgacaa	cagcagtggc	agcggcgcg	15000
aagagaactc	caacgcggca	gccgcggcaa	tgcagccggt	ggaggacatg	aacgatcatg	15060
ccattcgcgg	cgacaccttt	gccacacggg	ctgaggagaa	gcgcgctgag	gccgaagcag	15120
cggccgaagc	tgcgcggccc	gctgcgcaac	ccgaggtcga	gaagcctcag	aagaaaaccg	15180
tgatcaaac	cctgacagag	gacagcaaga	aacgcagtta	caacctataa	agcaatgaca	15240
gcaccttcac	ccagtaccgc	agctgtgtac	ttgcatacaa	ctacggcgac	cctcagaccg	15300
gaatccgctc	atggaccctg	ctttgcactc	ctgacgtaac	ctgcggctcg	gagcaggtct	15360
actggtcggt	gccagacatg	atgcaagacc	ccgtgacctt	ccgtccacg	cgccagatca	15420
gcaactttcc	ggtggtggg	gccgagctgt	tgcccgtgca	ctccaagagc	ttctacaacg	15480
accaggccgt	ctactcccaa	ctcatccgcc	agtttacctc	tctgaccac	gtgttcaatc	15540
gctttcccg	gaaccagatt	ttggcgcgcc	cgccagcccc	caccatcacc	accgtcagt	15600
aaaacgttcc	tgtcttcaca	gatcacggga	cgctaccgct	gcgcaacagc	atcgaggag	15660
tccagcgagt	gaccattact	gacgccagac	gccgcacctg	cccctacgtt	tacaaggccc	15720
tgggcatagt	ctcgccgcgc	gtcctatcga	gcgcgacttt	ttgagcaagc	atgttccatc	15780
ttatatcgcc	cagcaataac	acaggctggg	gcctgcgctt	cccaagcaag	atgtttggcg	15840
gggccaagaa	gcgctccgac	caacaccag	tgcgcgtgcg	cgggcactac	cgcgcgccct	15900
ggggcgcgca	caaacgcggc	cgactgggg	gcaccaccgt	cgatgacgcc	atcgacgcgg	15960
tgggtggagga	ggcgcgcaac	tacacgcca	cgccgccacc	agtgtccaca	gtggacgcgg	16020
ccattcagac	cgtggtgcgc	ggagcccgcc	gctatgctaa	aatgaagaga	cgccggaggg	16080
gcgtagcacg	tcgccaccgc	cgccgaccgc	gcactgccgc	ccaacgcgcg	gcggcgggcc	16140

tgcttaaccg	cgcacgtcgc	accggccgac	gggcgcccat	gcgggcccgt	cgaaggtctg	16200
ccgcgggtat	tgctactgtg	ccccccaggt	ccaggcgacg	agcggccgcc	gcagcagccg	16260
cggccattag	tgctatgact	cagggtcgca	ggggcaacgt	gtattgggtg	cgcgactcgg	16320
ttagcggcct	gcgcgtgccc	gtgcgcaccc	gcccccgcg	caactagatt	gcaagaaaaa	16380
actacttaga	ctcgtactgt	tgatgtatc	cagcgcgggc	ggcgcgcaac	gaagctatgt	16440
ccaagcgcaa	aatcaaaaga	gagatgtccc	aggtcatcgc	gccgagatc	tatggccccc	16500
cgaagaagga	agagcaggat	tacaagcccc	gaaagctaaa	gcgggtcaaa	aagaaaaaga	16560
aagatgatga	tgatgaactt	gacgacgagg	tggaactgct	gcacgctacc	gcgcccaagg	16620
gacgggtaca	gtggaaaagg	cgacgcgtaa	aacgtgtttt	gcgaccgggc	accaccgtag	16680
tctttacgcc	cggtgagcgc	tccacccgca	cctacaagcg	cgtgtatgat	gaggtgtacg	16740
gcgacgagga	cctgcttgag	caggccaacg	agcgccctcg	ggagtttgcc	tacggaagc	16800
ggcataagga	catgctggcg	ttgcccgtgg	acgagggcaa	cccaacacct	agcctaagc	16860
ccgtaaacact	gcagcaggtg	ctgcccgcgc	ttgcaccgtc	cgaagaaaaa	cgcgccctaa	16920
agcgcgagtc	tggtgacttg	gcacccaccg	tgacgtgat	ggtacccaag	cgccagcgac	16980
tggaagatgt	cttggaaaaa	atgaccgtgg	aacctgggct	ggagcccgag	gtccgcgtgc	17040
ggccaatcaa	gcaggtggcg	ccgggactgg	gcgtgcagac	cgtggacgtt	cagataccca	17100
ctaccagtag	caccagtatt	gccaccgcca	cagagggcac	ggagacacaa	acgtcccccg	17160
ttgcctcagc	ggtggcggat	gccgcggtgc	aggcggtcgc	tgcgcccgcg	tccaagacct	17220
ctacggaggt	gcaaaccggac	ccgtggatgt	ttcgcgtttc	agcccccgcg	cgcccccgcg	17280
gttcggagaa	gtacggcgcc	gccagcgcg	tactgcccga	atatgcccta	catccttcca	17340
ttgcgcctac	ccccgcttat	cgtggctaca	cctaccgccc	cagaagacga	gcaactacca	17400
gacgcccgaac	caccactgga	acccgccgcc	cccgctcgccg	tcgccagccc	gtgctggccc	17460
cgatttccgt	gcgcaggggtg	gctcgcgaag	gaggcaggac	cctggtgctg	ccaacagcgc	17520
gctaccacccc	cagcatcggt	taaaagccgg	tctttgtggt	tcttgcatat	atggccctca	17580
cctgcccgcct	ccgtttcccg	gtgcccggat	tccgaggaag	aatgcaccgt	aggaggggca	17640
tgggccggcca	cgccctgacg	ggcgccatgc	gtcgtgcgca	ccaccggcgg	cgcgcccgct	17700
cgcaccgtcg	catgcgcggc	ggtatcctgc	ccctccttat	tccactgatc	gccgcggcga	17760
ttggcgccgt	gcccggaaatt	gcatccgtgg	ccttgcaagg	gcagagacac	tgattaaaaa	17820
caagttgcat	gtggaaaaat	caaaaataaaa	agtctggact	ctcacgctcg	cttggtcctg	17880
taactattttt	gtagaatgga	agacatcaac	tttgcgtctc	tgcccccgcg	acacgctcgt	17940
cgcccggttca	tgggaaactg	gcaagatata	ggcaccagca	atatgagcgg	tgggcgccctc	18000
agctggggct	cgctgtggag	cggcattaaa	aatttcgggt	ccaccgttaa	gaactatggc	18060
agcaaggcct	ggaacagcag	cacaggccag	atgctgaggg	ataagttgaa	agagcaaaaat	18120
ttccaacaaa	agggtgtaga	tgccctggcc	tctggcatta	gcgggggtgt	ggactgtggc	18180
aaccaggcag	tgcaaaataa	gattaacagt	aagcttgatc	cccgcctccc	cgtagaggag	18240
cctccaccgg	ccgtggagac	agtgtctcca	gagggcggtg	gcgaaaagcg	tccgcgcccc	18300
gacagggaag	aaactctggt	gacgcaaata	gacgagcctc	cctcgtacga	ggaggcacta	18360
aagcaaggcc	tgcccaccac	ccgtcccatc	gcgcccatgg	ctaccggagt	gctggggcag	18420
cacacacccc	taacgctgga	cctgcctccc	cccgcgcaca	cccagcagaa	acctgtgctg	18480
ccaggcccga	ccgcgcttgt	tgtaacccgt	cctagccgcg	cgctccctgc	ccgcgcggcc	18540
agcggtccgc	gatcgtttgc	gcccgtagcc	agtggcaact	ggcaaaagc	actgaacagc	18600
atcggtgggtc	tggggggtgca	atccctgaag	gcgcgacgat	gcttctgaat	agctaaccgtg	18660
tcgtatgtgt	gtcatgtatg	cgcccatgtc	gccgcccagag	gagctgctga	gccgcgcgcg	18720
gcccgttttc	caagatggct	accccttcga	tgatgccgca	gtggtcttac	atgcacatct	18780
cggggccagga	cgccctcgag	tacctgagcc	ccgggctggt	gcagtttgcc	cgcgccaccg	18840
agacgtactt	cagcctgaat	aacaagttta	gaaacccccc	ggtggcgcc	acgcacgacg	18900
tgaccacaga	ccggtccacg	cgtttgacgc	tgcggttcat	ccctgtggac	cgtgaggata	18960
ctgctgactc	gtacaaggcg	cggttcaccc	tagctgtggg	tgataaccgt	gtgctggaca	19020
tggtctccac	gtactttgac	atccgcggcg	tgctggacag	gggcccctact	tttaagccct	19080
actctggcac	tgctacaac	gccctggctc	ccaagggtgc	cccaaatcct	tgcgaaatgg	19140
atgaagctgc	tactgtctct	gaaataaacc	tagaagaaga	ggacgatgac	aacgaagacg	19200
aagtagacga	gcaagctgag	cagcaaaaaa	ctcacgtatt	tgggcaggcg	ccttattctg	19260
gtataaatat	tacaaaggag	ggtattcaaa	taggtgtcga	aggtcaaaca	cctaaatatg	19320
ccgataaaac	atttcaacct	gaacctcaaa	taggagaatc	tcagtgtgtac	gaaactgaaa	19380
ttaatcatgc	agctgggaga	gtccttaaaa	agactacccc	aatgaaacca	tgttacgggt	19440
catatgcaaa	accacaaaat	gaaaatggag	ggcaaggcat	tcttgtaaa	caacaaaatg	19500
gaaagctaga	aagtcaagt	gaaatgcaat	ttttctcaac	tactgaggcg	accgcaggca	19560
atggtgataa	cttgactcct	aaagtggat	tgtacagtga	agatgtagat	atagaaaccc	19620
cagacactca	tatttcttac	atgccacta	ttaagggaag	taactcacga	gaactaatgc	19680
gccaacaatc	tatgcccac	aggcctaatt	acattgcttt	tagggacaat	tttattggct	19740
taatgtatta	caacagcacg	ggtaatatgg	gtgttctggc	gggccaagca	tcgagtttga	19800
atgctgttgt	agatttgcaa	gacagaaaca	cagagctttc	ataccagctt	ttgcttgatt	19860
ccattgttga	tagaaccagg	tacttttcta	tgtggaatca	ggctgttgac	agctatgatc	19920
cagatgttag	aattattgaa	aatcatggaa	ctgaagatga	acttccaaat	tactgctttc	19980
cactgggag	tgtgattaat	acagagactc	ttaccaaggt	aaaacctaaa	acaggtcagg	20040
aaaatggatg	ggaaaaagat	gctacagaat	tttcagataa	aaatgaaata	agagttggaa	20100

ataattttgc	catggaaatc	aatctaaatg	ccaacctgtg	gagaaatttc	ctgtactcca	20160
acatagcgct	gtatttgccc	gacaagctaa	agtacagtcc	ttccaaacgta	aaaattttctg	20220
ataacccaaa	cacctacgac	tacatgaaca	agcgagtggg	ggctcccggg	ttagtggagt	20280
gctacattaa	ccttgaggca	cgctgggtccc	ttgactatat	ggacaacgtc	aacctttta	20340
accaccaccg	caatgctggc	ctgcgtacc	gctcaatgtt	gctgggcaat	ggctcgctatg	20400
tgcccttcca	catccagtg	cctcagaagt	tctttgccat	taaaaacctc	cttctcctgc	20460
cgggctcata	cacctacgag	tggaaactca	ggaaggatgt	taacatgggt	ctgcagagct	20520
ccctaggaaa	tgacctaaag	gttgacggag	ccagcattaa	gtttgatagc	atttgccttt	20580
acgccacctt	cttccccatg	gccacaaca	cgccctccac	gcttgaggcc	atgcttagaa	20640
acgacaccaa	cgaccagtcc	tttaacgact	atctctccgc	cgccaacatg	ctctacccta	20700
taccgcgcaa	cgctaccaac	gtgcccata	ccatcccctc	ccgcaactgg	gcggctttcc	20760
gcggctgggc	cttcacgcgc	cttaagacta	aggaaacccc	atcactgggc	tcgggctacg	20820
acccttatta	cacctactct	gcctctatac	cctacctaga	tggaaaccttt	tacctcaacc	20880
acacctttta	gaagggtggc	attacctttg	actcttctgt	cagctggcct	ggcaatgacc	20940
gcctgcttac	ccccaacgag	tttgaaatta	agcgctcagt	tgacggggag	ggttacaacg	21000
ttgcccagtg	taacatgacc	aaagactggg	tcttggtaca	aatgctagct	aactacaaca	21060
ttggctacca	gggcttctat	atcccagaga	gctacaagga	ccgcatgtac	tccttcttta	21120
gaaacttcca	gcccatgagc	cgctcaggtg	tggatgatac	taaatacaag	gactaccaac	21180
aggtgggcat	cctacaccaa	cacaacaact	ctggatttgt	tggctacctt	gccccacca	21240
tgcgcgaaag	acaggcctac	cctgctaact	tcccctatcc	gcttataggc	aagaccgcag	21300
ttgacagcat	tacccagaaa	aagtttcttt	gcgatcgac	cctttggcgc	atccccctct	21360
ccagtaactt	tatgtccatg	ggcgcaacta	cagacctggg	ccaaaacctt	ctctacgcga	21420
actccgcccc	cgcgctagac	atgacttttg	aggtggatcc	catggacgag	cccacccttc	21480
tttatgtttt	gtttgaagtc	tttgacgtgg	tccgtgtgca	ccggccgcac	cgcgcgctca	21540
tcgaaaccgt	gtacctgcgc	acgcccttct	cgccgggcaa	cgccacaaca	taaagaagca	21600
agcaacatca	acaacagctg	ccgcctatgg	ctccagttag	caggaactga	aagccattgt	21660
caaagatctt	ggttgtgggc	catatttttt	gggcacctat	gacaagcgct	ttccaggctt	21720
tgtttctcca	cacaagctcg	cctgcgccat	agtcaatacg	gccggtcgcg	agactggggg	21780
cgctacactg	atggcctttg	cctggaaccc	gcaactcaaaa	acatgctacc	tcctttgagcc	21840
ctttggcttt	tctgaccagc	gactcaagca	ggtttaccag	tttgagtacg	agtcactcct	21900
gcgcgctagc	gccattgctt	cttccccgca	ccgctgtata	acgctggaag	agtcaccaca	21960
aagcgctacg	gggcccact	cgccgcctg	tggactatc	tgctgcatgt	ttctccacgc	22020
ctttgccaac	tggccccaaa	ctcccatgga	tcacaacccc	acatgaacc	ttattaccgg	22080
ggtaccacac	tccatgctca	acagtcacca	ggtacagccc	accctgcgtc	gcaaccagga	22140
acagctctac	agcttcctgg	agcgccactc	gccctacttc	cgagccaca	gtgcgcagat	22200
taggagcgcc	acttcttttt	gtcacttgaa	aaacatgtaa	aaataatgta	ctagagacac	22260
tttcaataaa	ggcaaatgct	tttatattgta	cactctcggg	tgattattta	ccccaccct	22320
tgccgtctgc	gccgtttaaa	aatcaaaggg	gttctgccc	gcatcgctat	gcgccactgg	22380
caggagacag	ttgcgatact	ggtgtttagt	gctccactta	aactcaggca	caaccatccg	22440
cggcagctcg	gtgaagtgtt	cactccacag	gctgcgcacc	atcaccaacg	cgtttagcag	22500
gtcgggcgcc	gatatcttga	agtcgcagtt	ggggcctccg	ccctgcgcgc	gcgagttgag	22560
atacacaggg	ttgcagcact	ggaacactat	cagcgccggg	tgggtgcacg	tggccagcac	22620
gctcttctgc	gagatcagat	ccgcgtccag	gtcctccgcg	ttgctcaggg	cgaacggagt	22680
caactttggg	agctgccttc	ccaaaaaggg	cgctgcccga	ggctttgagt	tgcaactcga	22740
ccgtagtggt	atcaaaagg	gaccgtgccc	ggtctgggcg	ttaggataca	gcgcctgcat	22800
aaaagccttg	atctgcttaa	aagccacctg	agccttttgc	ccttcagaga	agaacatgcc	22860
gcaagacttg	ccggaaaact	gattggccgg	acaggccgcg	tcgtgcacgc	agcaccttgc	22920
gtcgggtgtg	gagatctgca	ccacatttcg	gccccaccgg	ttcttcacga	tcttggcctt	22980
gctagactgc	tccttcagcg	cgcgctgccc	gttttcgctc	gtcacatcca	tttcaatcac	23040
gtgctcctta	tttatcataa	tgcttccgtg	tagacactta	agctcgctt	cgatctcagc	23100
gcagcggtgc	agccacaacg	cgagcccgt	gggctcgtga	tgctttagag	tcacctctgc	23160
aaacgactgc	aggtacgcct	gcaggaatcg	ccccatcacc	gtcacaaaag	tcttgttgc	23220
ggtgaagggt	agctgcaacc	cgcggtgctc	ctcgctcagc	caggctttgc	atacggccgc	23280
cagagcttcc	acttggctag	gcagtagttt	gaagttcgcc	tttagatcgt	tatccacgtg	23340
gtacttgtcc	atcagcgcg	gcgcagcctc	catgcccttc	tcccacgcag	acacgatcgg	23400
cacactcagc	gggttcatca	ccgtaatttc	actttccgct	tcgctgggct	cttctcttct	23460
ctcttgctgc	cgcataccac	gcgccactgg	gtcgtcttca	ttcagccgcc	gcactgtgcy	23520
cttacctcct	ttgccatgct	tgattagcac	cggtgggttg	ctgaaaccca	ccattttag	23580
cgccacatct	tctctttctt	cctcgctgtc	cacgattacc	tctggtgatg	gcgggcgctc	23640
gggcttggga	gaagggcgct	tctttttctt	cttgggcgca	atggccaaat	ccggcgccga	23700
ggtcgatggc	cgcggggctg	gtgtgcgcgg	caccagcgcg	tcttgtgatg	agcttctctc	23760
gtcctcgagc	tcgatacgcc	gcctcatccg	cttttttggg	ggcgcccggg	gaggcgggcg	23820
cgacggggac	ggggacgaca	cgtcctccat	ggttggggga	cgtcgcgccg	caccgcgtcc	23880
gcgctcgggg	gtgggttctgc	gctgctcctc	ttcccagctg	gccatttctt	tctctatag	23940
gcagaaaaag	atcatggagt	cagtcgagaa	gaaggacagc	ctaaccggcc	cctctgagtt	24000
gccaccaccc	gcctccaccg	atgccgcca	cgcgctacc	accttccccg	tcgaggcacc	24060

```

ccccgcttgag gaggaggaag tgattatcga gcaggaccca ggttttgtaa gcgaagacga 24120
cgaggaccgc tcagtagcaa cagaggataa aaagcaagac caggacaacg cagaggcaaa 24180
cgaggaacaa gtcgggcccgg gggacgaaa gcatggcgac tacctagatg tgggagacga 24240
cgtgctgttg aagcatctgc agcgccagt gcccattatc tgcgacgcgt tgcaagacg 24300
cagcgatgtg cccctcgcca tagcgatgt cagccttgcc tacgaacgcc acctattctc 24360
accgcgcgta ccccccacac gccaaagaaa cggcacatgc gagcccaacc cgcgcctcaa 24420
cttctacccc gtatttgccg tgcagaggt gcttgccacc tatcacatct ttttccaaa 24480
ctgcaagata cccctatcct gccgtgccaa ccgcagccga gcggacaagc agctggcctt 24540
gcggcagggc gctgtcatal cctgatctgc ctcgctcaac gaagtgccaa aaatctttga 24600
gggtcttggg cgcgacgaga agcgcgccg aaacgctctg caacaggaaa acagcgaaaa 24660
tgaaagtac tctggagtgt tggtggaact cgagggtgac aacgcgcgcc tagccgtact 24720
aaaacgcagc atcgaggtca cccactttgc ctacccggca cttaacctac cccccaaggt 24780
catgagcaca gtcatgagt agctgatcgt .gcgccgtgcg cagccctgg agagggtgc 24840
aaatttgcaa gaacaaacag aggagggcct acccgagtt ggcgacgagc agctagcgcg 24900
ctggcttcaa acgcgcgagc ctgccgactt ggaggagcga cgcaactaa tgatggccgc 24960
agtgtcgtt accgtggagc ttgagtgcac gcagcggttc tttgctgacc cggagatgca 25020
gcgcaagata gaggaaacat tgactacac ctttcgacag ggctacgtac gccaggcctg 25080
caagatctcc aacgtggagc tctgcaacct ggtctctac cttggaattt tgcacgaaaa 25140
ccgccttggg caaacctgc ttcattccac gctcaaggcc gaggcgcgcc gcgactacgt 25200
ccgcgactgc gtttacttat ttctatgcta cactggcgag acggccatgg gcgtttggca 25260
gcagtgttgc gaggagtgc acctcaagga gctgcagaaa ctgctaaagc aaaactgaa 25320
ggacctatgg acggccttca acgagcgctc cgtggccgcg cacttgccgg acatcatttt 25380
ccccgaacgc ctgcttaaaa ccctgcaaca ggtctgcca gacttcacca gtcaaagcat 25440
gttgcaaac ttaggaact ttatcctaga gcgctcagga atcttgcccg ccacctgctg 25500
tgcaactctt agcgactttg tgcccattaa gtaccgcgaa tgccctccgc cgctttgggg 25560
ccactgtcac cttctgacg tagccaaacta ccttgccctac cactctgaca taatggaaga 25620
cgtgagcggt gacggtctac tggagtgtca ctgctgctgc aacctatgca cccgcaccg 25680
ctccctggtt tgcaattcgc agctgcttaa cgaaagtcaa attatcggtc cctttgagct 25740
gcagggtccc tcgcctgacg aaaagtccgc ggctccgggg ttgaaactca ctccggggct 25800
gtggacgtcg gcttaccttc gcaaatttgt acctgaggac taccacgccc acgagattag 25860
gttctacgaa gaccaatccc gcccgcgaaa tgcggagctt accgcctgcg tcattacca 25920
gggccacatt cttggccaat tgcaagccat caacaaagcc cgccaagagt tctgtctacg 25980
aaaggagcgg ggggtttact tggaccccca gtccggcgag gagctcaacc caatcccccc 26040
gccgcgcgag cctatcagc agcagccgcg ggcccttgct tccaggatg gcacccaaa 26100
agaagctgca cgtgcccgcc ccacccacgg acgaggagga atactgggac agtcaggcag 26160
aggaggtttt ggacgaggag gaggaggaca tgatggaaga ctgggagagc ctgacgagg 26220
aagcttccga ggtcgaagag gtgtcagacg aaacaccgtc accctcggtc gcattccct 26280
cgccggcgcc ccagaaatcg gcaaccggtt ccagcatggc tacaacctcc gctcctcagg 26340
cgccggcgcc actgcccgtt cgccgaccca accgtagatg ggacaccact ggaaccagg 26400
ccggttaagtc caagcagccg ccgcccgttag cccaagagca acaacagcgc caaggctacc 26460
gctcatggcg cgggcacaa gaaacccatag ttgcttgctt gcaagactgt gggggcaaca 26520
tctccttcgc ccgcccgtt cttctctacc atcacggcgt ggccctcccc cgtaacatcc 26580
tgcatctata ccgtcatctc tacagcccat actgcaccgg cggcagcgcc agcggcagca 26640
acagcagcgg ccacacagaa gcaaggcgca ccgcatagca agactctgac aaagcccaag 26700
aaatccacag cggcggcagc agcaggagga ggagcgctgc gtctggcgcc caacgaacct 26760
gtatcgaccc gcgagcttag aaacaggatt tttccactc tgtatgctat atttcaacag 26820
agcaggggccc aagaacaaga gctgaaaata aaaaacagg ctctgcgac cctcaccgcg 26880
agctgcctgt atcacaaaag cgaagatcag cttcggcgca cgctggaaga cgcggaggct 26940
ctcttcagta aatactgcgc gctgactctt aaggactagt ttcgcgccct tctcaaat 27000
taagcgcgaa aactacgtca tctccagcgg ccacaccgg cgccagcacc tgtcgtcagc 27060
gccattatga gcaaggaat tcccacgccc tacatgtgga gttaccagcc acaaatggga 27120
cttgccgctg gagctgcccc agactactca accgaataa actacatgag cgcgggacct 27180
cacatgatata cccgggtcaa cggaatccgc gccaccgaa accgaattct cttggaacag 27240
gcggtatata ccaccacacc tcgtaataac cttaatcccc gtatgtggcc cgctgccctg 27300
gtgtaccagg aaagtcccgc tcccaccact gtggtacttc ccagagacgc ccaggccgaa 27360
gttcagatga ctaactcagg ggcgcagctt gcgggcggct ttcgtcacag ggtgcggtc 27420
ccgggagcag gtataactca cctgacaatc agagggcgag gtattcagct caacgacgag 27480
tcggtgagct cctcgcttgg tctccgtccg gacgggacat ttcagatcgg cgcgcggcgc 27540
cgctcctcat tcacgcctcg tcaggcaatc ctaactctgc agacctcgtc cctctgagccg 27600
cgctctggag gcattggaac tctgcaattt attgaggagt ttgtgccatc ggtctacttt 27660
aacccttct cggaacctcc cgccactat cggtatcaat ttattcctaa ctttgacgcg 27720
gtaaaggact cggcgagcgg ctacgactga atgttaagt gagaggcaga gcaactgcgc 27780
ctgaaacacc tgggtccactg tcgcccgcac aagtgtcttg ccgcgactc cggtgagttt 27840
tgtactttg aattgccccg ggatcatatc gagggcccg cgacggcggt ccggttacc 27900
gccagggag agcttgccg tagcctgatt cgggagtta cccagcgccc cctgctagtt 27960
gagcgggaca ggggacctg tgttctcact gtgatttgca actgtcctaa ccttgatta 28020

```

catcaagatc tttgttgcca tctctgtgct gagtataata aatacagaaa ttaaaatata 28080
ctggggctcc tatcgccatc ctgtaaacgc caccgtcttc acccgcccaa gcaaaccaag 28140
gcgaacctta cctggctact ttaacatctc tccctctgtg atttacaaca gtttcaacc 28200
agacggagtg agtctacgag agaacctctc cgagctcagc tactccatca gaaaaaacac 28260
caccctcctt accctgcggg aacgtacgag tgcgtcaccg gccgtgcac cacacctacc 28320
gcctgaccgt aaaccagact ttttccggac agacctcaat aactctgttt accagaacag 28380
gaggtgagct tagaaaaccc ttaggttatt aggccaaagg cgcagctact gtgggggtta 28440
tgaacaattc aagcaactct acgggctatt ctaattcagg tttctctagg gttgggggtta 28500
tctctgtct tgtgattctc tttattctta tactaacgct tctctgccta aggctcgccg 28560
cctgtctgtg gcacatttgc atttattgtc agctttttaa acgctggggg cgccacccaa 28620
gatgattagg tacataatcc taggtttact cacccttgcg tcagccacag gtaccacca 28680
aaaggtggat tttaaggagc cagcctgtaa tgttacattc gcagctgaag ctaatgagtg 28740
caccactctt ataaaatgca ccacagaaca tgaaaagctg cttattcgcc acaaaaacaa 28800
aatggcaag tatgctgttt atgctatttg gcagccaggt gacactacag agtataatgt 28860
tacagtttcc cagggtaaaa gtcataaaac ttttatgtat acttttccat tttatgaaat 28920
gtgcgacatt accatgtaca tgagcaaaac gtataagttg tggcccccac aaaattgtgt 28980
ggaaaacact ggcactttct gctgcactgc tatgctaatt acagtgtctg ctttggctcg 29040
taccctactc tatattaaat acaaaagcag acgcagcttt attgaggaaa agaaaatgcc 29100
ttaatttact aagttacaaa gctaattgca ccactaactg ctttactcgc tgccttgcaaa 29160
acaaattcaa aaagttagca ttataattag aataggattt aaaccccccg gtcatttctc 29220
gctcaatacc attcccctga acaattgact ctatgtggga tatgctccag cgctacaacc 29280
ttgaagtcag gcttccctga tgtcagcatc tgactttggc cagcacctgt cccgcggatt 29340
tgttccagtc caactacagc gacccaccct aacagagatg accaacacaa ccaacgcggc 29400
cgccgctacc ggacttacat ctaccacaaa tacaccccaa gtttctgcct ttgtcaataa 29460
ctgggataac ttgggcatgt ggtggttctc catagcgtt atgtttgtat gccttattat 29520
tatgtggctc atctgctgcc taaagcgcaa acgcgcccga ccacctctc atagtcccat 29580
cattgtgcta caccacaaac atgatggaat ccatagattg gacggactga aacacatgtt 29640
cttttctctt acagtatgat taaatgagac atgattcctc gaggttttat attactgacc 29700
cttgttgctc ttttttgtgc gtgtccaca ttggctgcgg tttctcacat cgaagtagac 29760
tgcatccag ccttcacagt ctatttgcct tacggatttg taccctcac gctcatctgc 29820
agcctcatca ctgtggtcat cgcttttctc cagtgcattg actgggtctg tgtgcgcttt 29880
gcatatctca gctgtgcca tgttgtgttg ctaccatgtt gttttcatgt gttgctgcca 29940
tgctcttgct gccttagatc tctctttatg tagtgttggt gtgtctctct tgtcgtgatg 30000
tgtgttttgt cctatatatt ttaattttta atccaaacc ctgtcccgc agagccctt 30060
gcgttctggt aggcgctcat tgaaaactga cttaactcgt taaattaaaa aaatgtaaaa 30120
aataatggtt gagactcagc ccaacatcgg cagatgaggt ggattgagac tcagcccaac 30180
atcggcagat gaggtggatt gagactcaac ccaacattg gcagatgagg tgaattagat 30240
gaggtgatt gagactcatg aggggtgtat gagggcccga cgtccacagg tgggagttgt 30300
gctttacagt ccaacgtgca ggacgcttgg catttgccag agaacaccaa gattggcaaa 30360
ttcgcaactg gcgcccgtgt ctcttcacag acggaaaaat gaccaaatac tgattatttt 30420
tgtaaaacgg aaaccgaatg tccgacaaag ttcatattgat gacttcccgg taggtctgcc 30480
ctgcgcctgg gccgacggc tccgggaatt ttacaaacga tttcggacgt ctagcatctg 30540
ctcaccttgt caaggacctg aggatctctg cacccttatt aagacctgt gcggtctcaa 30600
agatcttatt ccctttaact aataaaaaaa aataataaag catcacttac ttaaaatcag 30660
ttagcaaat tctgtccagt ttattcagca gcacctcct gccctcctcc cagctctggt 30720
attgcagctt cctcctggct gcaaactttc tccacaatct aaatggaatg tcagtttctc 30780
cctgttctctg tccatccgca cccactatct tcatgttgtt gcagatgaag cgcgcaagac 30840
cgtctgaaga taccttcaac cccgtgtatc catatgacac ggaaaccggt cctccaactg 30900
tgcttttct tactcctccc tttgtatccc ccaatgggtt tcaagagagt cccctgggg 30960
tactctctt gcgcctatcc gaacctctag ttacctcaa tggcatgctt gcgctcaaaa 31020
tgggcaacgg cctctctctg gacgaggccg gcaaccttac ctcccaaat gtaaccactg 31080
tgagcccacc tctcaaaaaa accaagtcaa acataaacct ggaaatatct gcaccctca 31140
cagttacctc agaagcccta actgtggctg ccgcccacc tctaattggtc gcgggcaaca 31200
cactcaccat gcaatcacag gcccgctaa ccgtgcacga ctccaaactt agcattgcca 31260
cccaaggacc cctcacagt tcaagaggaa agctagccct gcaaacatca ggccccctca 31320
ccaccaccga tagcagtacc cttactatca ctgcctcacc ccctctaact actgccactg 31380
gtagcttggg cattgacttg aaagagccca tttatacaca aaatggaaaa ctaggactaa 31440
agtagggggc tcctttgcat gtaacagacg acctaaacac tttgaccgta gcaactgggtc 31500
caggtgtgac tattaataat acttcttgc aaactaaagt tactggagcc ttgggttttg 31560
attcacaagg caatatgcaa cttaatgtat caggaggact aaggattgat tctcaaaaca 31620
gacgccttat acttgatgtt agttatccgt ttgatgctca aaaccaacta aatctaagac 31680
taggacaggg ccctcttttt ataaactcag cccacaactt ggatattaac tacaacaaag 31740
gcctttactt gtttacagct tcaacaatt ccaaaaagct tgaggttaac ctaagcactg 31800
ccaaggggtt gatgtttgac gctacagcca tagccattaa tgcaggagat gggcttgaat 31860
ttggttcacc taatgcacca aacacaaatc ccctcaaaac aaaaattggc catggcctag 31920
aatttgattc aaacaaggct atggttctca aactaggaac tggccttagt tttgacagca 31980

caggtgccat	tacagtagga	aacaaaaata	atgataagct	aactttgtgg	accacaccag	32040
ctccatctcc	taactgtaga	ctaaatgcag	agaaaagatgc	taaactcact	ttggtcttaa	32100
caaaatgtgg	cagtcaaata	cttgctacag	tttcagtttt	ggctgttaaa	ggcagtttgg	32160
ctccaatatc	tggaaacagtt	caaagtgctc	atcttattat	aagatttgac	gaaaatggag	32220
tgctactaaa	caattccttc	ctggaccag	aatattggaa	ctttagaaat	ggagatctta	32280
ctgaaggcac	agcctataca	aacgctgttg	gatttatgcc	taacctatca	gcttatccaa	32340
aatctcacgg	taaaactgcc	aaaagtaaca	ttgtcagtc	agtttactta	aacggagaca	32400
aaactaaacc	tgtaacacta	accattacac	taaacggtac	acaggaaaca	ggagacacaa	32460
ctccaagtgc	atactctatg	tcattttcat	gggactggtc	tggccacaac	tacattaatg	32520
aaatatattgc	cacatctctt	tacacttttt	catacattgc	ccaagaataa	agaatcgttt	32580
gtgttatgtt	tcaacgtgtt	tatttttcaa	ttgcagaaaa	tttcaagtca	tttttcatc	32640
agtagtatag	ccccaccacc	acatagctta	tacagatcac	cgtaccttaa	tcaaaactcac	32700
agaaccctag	tattcaacct	gccacctccc	tcccaacaca	cagagtacac	agtcctttct	32760
ccccggctgg	ccttaaaaag	catcatatca	tgggtaacag	acatatctct	aggtgttata	32820
ttccacacgg	ttctctgtcg	agccaaacgc	tcacagtgga	tattaataaa	ctccccggg	32880
agctcactta	agttcatgtc	gctgtccagc	tgctgagcca	caggctgctg	tccaacttgc	32940
ggttgcttaa	cgggcggcga	aggagaagtc	cacgcctaca	tgggggtaga	gtcataatcg	33000
tgcatcagga	tagggcggtg	gtgctgcagc	agcgcgcgaa	taaactgctg	ccgcgcgcgc	33060
tccgtcctgc	aggaatacaa	catggcagtg	gtctcctcag	cgatgattcg	caccgcccgc	33120
agcataaggc	gccttgtcct	cggggcacag	cagcgcaccc	tgatctcact	taaatcagca	33180
cagtaactgc	agcacagcac	cacaatatgt	ttcaaaatcc	cacagtgcga	ggcgctgtat	33240
ccaaagctca	tggcggggac	cacagaaccc	acgtggccat	cataccacaa	gcgcaggtag	33300
attaagtggc	gacccctcat	aaacacgctg	gacataaaca	ttacctcttt	tggcatgttg	33360
taattcacca	cctcccggta	ccatataaac	ctctgattaa	acatggcgcc	atccaccacc	33420
atcctaaacc	agctggccaa	aacctgcccg	ccggctatac	actgcaggga	accgggactg	33480
gaacaatgac	agtggagagc	ccaggactcg	taacctatga	tcatcatgct	cgctcatgata	33540
tcaatgttgg	cacaacacag	gcacacgtgc	atacacttcc	tcaggattac	aagctcctcc	33600
cgcgtagaag	ccatatccca	gggaacaacc	cattcctgaa	tcagcgtaaa	tcccacactg	33660
cagggagagc	ctcgcacgta	actcacgttg	tgcatgttca	aagtgttaca	ttcgggcagc	33720
agcgatgat	cctccagtat	ggtagcgcgg	gtttctgtct	caaaaggagg	tagacgatcc	33780
ctactgtacg	gagtgccggc	agacaaccga	gatcggtgtg	gtcgtagtgt	catgccaaat	33840
ggaacgccgg	acgtagtcat	atttcttgaa	gcaaaaccag	gtgcgggcgt	gacaaacaga	33900
tctgcgtctc	cggctctgcc	gcttagatcg	ctctgtgtag	tagttgtagt	atatccactc	33960
tctcaaaagc	tccaggcgcc	ccctggcttc	gggttctatg	taaactcctt	catgcgcgcg	34020
tgccctgata	acatccacca	ccgcagaata	agccacaccc	agccaaacct	cacattcggt	34080
ctgcgagtca	cacacgggag	gagcgggaag	agctggaaga	accatgtttt	tttttttatt	34140
ccaaaagatt	atccaaaacc	tcaaaatgaa	gatctattaa	gtgaacgcgc	tccctcccg	34200
tggcgtggtc	aaactctaca	gccaaagaac	agataatggc	atttgtaaga	tggtgcacaa	34260
tggcttccaa	aaggcaaacg	gccctcacgt	ccaagtggac	gtaaaggcta	aaccttctag	34320
ggtgaatctc	ctctataaac	attccagcac	cttcaacct	gccccaaata	ttctcatctc	34380
gccaccttct	caatatatct	ctaagcaaat	ccgaatat	aagtcggcc	attgtaaaaa	34440
tctgtctcag	agcgccctcc	accttcagcc	tcaagcagcg	aatcatgatt	gcaaaaattc	34500
aggttctctc	cagacctgta	taagattcaa	aagcggaaaca	ttacaaaaaa	taccgcgatc	34560
ccgtagggtc	cttcgcaggg	ccagctgaac	ataatcgtgc	aggctctgcac	ggaccagcgc	34620
ggccacttcc	ccgccaggaa	ccttgacaaa	agaaccacac	ctgattatga	cacgcatact	34680
cggagctatg	ctaaccagcg	tagccccgat	gtaagctttg	ttgcattggc	ggcgatataa	34740
aatgcaagg	gctgctcaaa	aaatcaggca	aagcctcgcg	caaaaaagaa	agcacatcgt	34800
agtcattgctc	atgcagataa	aggcaggtaa	gctccggaac	caccacagaa	aaagacacca	34860
tttttctctc	aaacatgtct	gcgggtttct	gcataaacac	aaaataaaat	aacaaaaaaa	34920
catttaaaca	ttagaagcct	gtcttacaac	aggaaaaaca	acccttataa	gcataagacg	34980
gactacggcc	atgccggcgt	gaccgtaaaa	aaactggtca	ccgtgattaa	aaagcaccac	35040
cgacagctcc	tcgggtcatgt	ccggagtcac	aatgtaagac	tcggtaaaaca	catcaggttg	35100
attcatcggt	cagtgtctaaa	aagcgaccga	aatagcccg	gggaatacat	acccgcaggc	35160
gtagagacaa	cattacagcc	cccataggag	gtataacaaa	attaatagga	gagaaaaaca	35220
cataaacacc	tgaaaaaccc	tcctgcctag	gcaaaatagc	accctcccg	tccagaacaa	35280
catacagcgc	ttcacagcgg	cagcctaaca	gtcagcctta	ccagtaaaaa	agaaaaaccta	35340
ttaaaaaaac	accactcgac	acggcaccag	ctcaatcagt	cacagtgtaa	aaaaggccca	35400
agtgcggtac	actgcagcag	gtgtgactca	gccatggcac	ctctgcagcc	tgggtaccct	35460
gcttggggca	tgcccccctta	tagctggcgg	ggcggtgggg	gctctgtagg	agtggcagcg	35520
acctcagtg	ttgtctttgc	tctgaagagc	cctccagggtg	cttgatccca	ccttttccca	35580
gcaggaacac	tcctgcctgc	cttaccacct	gtcctggctg	atggcctgtt	cctgcctcct	35640
ttgccccctg	cccagactcc	catgttctctg	gacttgtggc	ttcctccaac	caggggctct	35700
caagcctcca	tacctgggtcc	cacctctcca	ggcgtgggga	gggaggttga	ggaggggtga	35760
gggcatctgg	ttgggggcag	cctgggtgtt	cccctcccat	cccctccctg	ggcctccctg	35820
gccccctcta	ctcttgagca	atgctcttga	gagcttctctg	cctggctctt	aacccagggc	35880
aagccctgga	agggcagacc	caggacactc	tcaccacttc	cttacctttt	cccctggaaa	35940

aatcttctgt ata^{ctt}ccca ttttaagaaa actacaattc ccaacacata caagttactc 36000
 cgccctaaaa cctacgtcac ccgccccgtt ccacgcccc gcgccacgtc acaaactcca 36060
 cccctcatt atcatattgg cttcaatcca aaataaggta tattattgat gatg 36114

<210> 17
 <211> 40
 <212> PRT
 <213> Adenovirus subgroup C

<400> 17
 Met Thr Gly Ser Thr Ile Ala Pro Thr Thr Asp Tyr Arg Asn Thr Thr
 1 5 10 15
 Ala Thr Gly Leu Thr Ser Ala Leu Asn Leu Pro Gln Val His Ala Phe
 20 25 30
 Val Asn Asp Trp Ala Ser Leu Asp
 35 40

<210> 18
 <211> 19
 <212> PRT
 <213> Adenovirus subgroup C

<400> 18
 Met Trp Trp Phe Ser Ile Ala Leu Met Phe Val Cys Leu Ile Ile Met
 1 5 10 15
 Trp Leu Ile

<210> 19
 <211> 8
 <212> PRT
 <213> Adenovirus subgroup C

<400> 19
 Lys Arg Arg Arg Ala Arg Pro Pro
 1 5

<210> 20
 <211> 42
 <212> PRT
 <213> Adenovirus subgroup C

<400> 20
 Cys Cys Leu Lys Arg Arg Arg Ala Arg Pro Pro Ile Tyr Arg Pro Ile
 1 5 10 15
 Ile Val Leu Asn Pro His Asn Glu Lys Ile His Arg Leu Asp Gly Leu
 20 25 30
 Lys Pro Cys Ser Leu Leu Leu Gln Tyr Asp
 35 40